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ABSTRACT

The instructional development (ID) process is a teaching method that can be applied to an entire course, unit, or subject. The ID process can be compared to the decision making stages in purchasing and designing a house. These stages involve such concepts as communication theory, audience analysis, and study of goals and objectives. The choice of ideal and practical strategies must be considered in terms of student needs and effectiveness of class presentation. Using media specialists to help in the selection of appropriate materials to carry out the lesson is the next step. Such evaluated materials can include films, filmstrips, tape recordings, slides, and games, as well as print resources. Selected materials are then tested with a small group of students from the classroom. If necessary, the strategy is modified and then put into practice. The six steps in using a successful instructional package are: (1) prepare yourself (the classroom teacher); (2) prepare the environment; (3) prepare the students; (4) use the medium; (5) review; and (6) test. This system of revising and selecting new materials and equipment is particularly appropriate to the use of films in the classroom. (FG)

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# INSTRUCTIONAL DEVELOPMENT FOR THE CLASSROOM TEACHER

by

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# CHAPTER 1
# OVERVIEW

As we have observed and utilized the process of instructional development in our professional activities, we have been impressed with the wisdom of the professional teachers of the past. The truly good teachers have always instinctively used the process we now call instructional development. Since it seemed to be a kind of inborn or instinctive process, we were unable to teach it. Hence, we talked about "the art of teaching" or said that "good teachers are born, not made."

With the arrival of the so-called "teaching machine" in the 1950's and the wealth of research that these early machines have spawned, we can now start to talk about the science of teaching. The convergence of a great diversity of research from many fields, i.e., computer technology, the psychology of learning, audiovisual communications, tests and measurements, etc., has led to the point where the process of instructional development can begin to take the practicing teacher who was not "born" a great teacher and teach that person to at least think like the great teachers. This "science of teaching" is in its infancy, but the process is sound and should prove to be a useful tool in educating the nation.

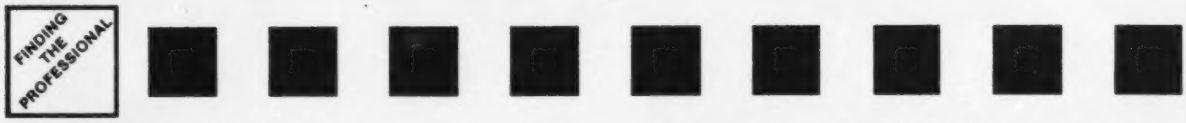
Our hope, then, is that this brief treatise of the instructional development (ID) process will enable you, the classroom teacher, to apply ID to various aspects of your classroom. We suggest you begin by using the process with a one-hour unit and then work your way up to larger and larger units until you can apply the instructional development process to the entire course, class, or subject that you are teaching.

# CHAPTER 2
# A MODEL

Instructional development is a process that has parallels in many aspects of our lives. The authors have observed the use of similar processes in many fields and regularly use the process as a means of making personal decisions on the purchase of such things as automobiles, home stereo sets, vacuum cleaners and even our own homes.

The purchase of a house parallels the instructional development process in the classroom. We talked to a local architect about the process of working with a client and were amazed at the sameness of communication processes used in this field and the instructional development field.

In this chapter we offer a side by side comparison of the work of an architect with a house building client and the work of an instructional developer with a school teaching client.




You have been looking at your current residence and have concluded that it is no longer adequate for you. You think you would like to build a house of your own, but you don't want a typical "tract" home, so you begin to look for an architect with whom you can work. The selection process includes looking at existing non-tract homes, talking to people who have recently built their own homes and looking in the phone book in the yellow pages under "architect." The next step is to make an appointment with the selected architect. At your initial meeting you attempt to establish rapport and determine whether or not to work with this particular architect. The first meeting, of course, does not imply any long-term commitment on either your part or on the part of the architect.

You have been looking at your current classroom and have concluded that things cannot go on the way they have been. You think that you would like to build a curriculum of your own but you don't want a typical commerical package. So you begin to look for a curriculum planner (instructional developer) with whom you can work. The selection process includes looking at existing non-commercial packages, talking to people who have designed their own curriculum and checking the school directory for those people who are designated to work with curriculum. The next step is to make an appointment with the selected instructional developer. At your initial meeting, you attempt to establish rapport and determine whether or not to work with this particular instructional developer. The first meeting, of course, does not imply any long-term commitment on either your part or on the part of the instructional developer.

Once you and the architect have agreed to work together, the architect begins the process of determining what kind of a person you are and what kind of a house will meet your needs. S/he will ask questions such as how many people will live in the house immediately, how many will live in the house 5, 10, and 15 years from now, the approximate ages of the occupants, any physical limitations which might affect the mobility of the occupants, and their attitudes toward certain preferred building materials. The architect will also ask questions about your social status, what image you wish to convey and how much money you have to spend. Other factors the architect considers include ethnic background, preferred style, and the whole host of things which make you and your family a unique set of human beings.

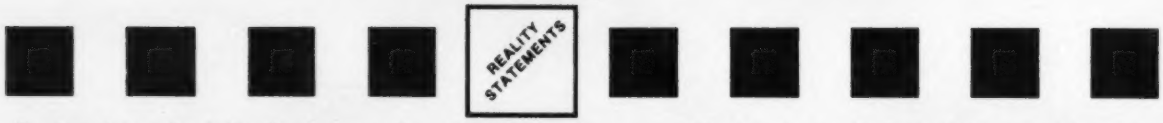
Once you and the instructional developer have agreed to work together, the instructional developer begins the process of determining what kind of a person you are and what kinds of students you will be working with. S/he will ask questions such as how many students are in the classroom now and how many there will be 5, 10, and 15 years from now, what are the ages of the students, and are there any physical limitations which might affect the mobility of the students, how well can these students read, write, talk, and listen, and what are the students' attitudes toward certain types of learning materials. The instructional developer will also ask questions about the social status of you and your students as well as the students' economic status. Other factors considered include ethnic backgrounds, preferred teaching and learning styles and a whole host of things which make you and your class a unique set of human beings.

Now that the architect knows who you are, s/he needs to determine what activities are going to go on in this house. For instance, if you regularly use your home for business purposes, the type of business in which you are engaged will determine the size, location and arrangement of this work area. If you entertain regularly, the architect must determine the usual number of people entertained, the intimacy of the usual group and whether a special bar or games area is required. If many small children are contemplated, a special nursery/ laundry area may be appropriate. Other special considerations may include love of garden, number of automobiles and special hobbies.

Now that the instructional developer knows who you are, s/he needs to determine what activities are going to go on in this classroom. For instance, if you regularly teach children physical skills, the type of skills taught will determine the size, location and arrangement of this activity. If you teach mathematics, this subject will determine the number of chalkboards, computers and other math tools that will be needed. S/he will try to set the educational outcomes (behavioral objectives) in as exact a terminology as possible.

Using the knowledge gained in the previous interview, the architect begins to arrange the various functional areas of the house. These arrangements are tentative and the advantages and disadvantages of each are discussed with you, the buyer. You, based on your own feelings and in consultation with others, determine which arrangement appears to best match you and your needs.

Using the knowledge gained in the previous interview, the instructional developer begins to list the various teaching strategies that might have a bearing on the behavioral objectives. These strategies are tentative and the advantages and disadvantages of each are discussed with you, the teacher. You, based on your own feelings and in consultation with others, determine which strategies appear to best match you and your students.

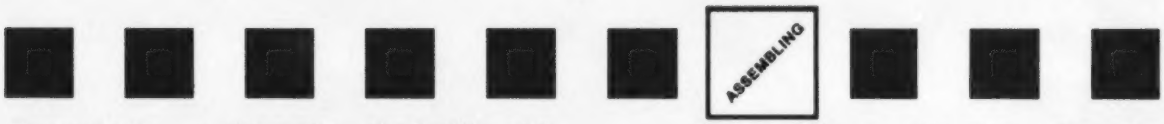



Having determined the best general arrangements for your house, the architect begins the process of drawing the blueprint. Depending upon the size of the firm, many other people (reflecting many specialties) will contribute to various aspects of the blueprint planning. Separate plans will be drawn for the electrical, plumbing, heating, and framing systems. Local zoning laws, specific references to site characteristics, and special attributes of the preferred building materials will be blended into the final drawings. You and the architect will meet frequently during the drawing process so that the end product accurately reflects the merging of you, your needs, the building materials and the site.

Having determined the best teaching strategies for meeting your educational objectives, the instructional developer begins the process of outlining the specific media materials and methods which will best serve the desired strategies. Depending upon the size of the school system many other people (reflecting many specialties) will contribute to various aspects of the outlining. Separate outlines will be prepared for book orders, motion picture film orders, and requisitions for transportation needed for study trips. Restrictions on class activities imposed by time restraints, distances, space limitations and any special characteristics of the class will be blended into the final strategies. You and the instructional developer will meet frequently during the strategy outlining process so that the end product accurately reflects the merging of you, your class, the strategies and the classroom.

The completed blueprint is now delivered to a builder. The final selection of a builder follows the same pattern as the selection of the architect. The builder talks with his/her suppliers and peruses catalogs to find the materials to turn the blueprint idea into the reality of a house. For example, the blueprint calls for a light fixture at a certain location in the living room. Perhaps even the basic style is determined on the blueprint. You and the builder select the final light fixture from the fixtures currently available. If the available fixtures do not meet your expectations, you may need to design your own and have one made to order. These buy or construct decisions are made for all elements in the construction planning.

The completed strategy outline is now delivered to the media specialists, curriculum planners and others who are needed to purchase or produce the materials and arrangements necessary to assemble the instructional package. The final selection of these individuals follows the same pattern as the selection of the instructional developer. These para-professionals talk with their suppliers and peruse catalogs to find the materials to turn the outline into the reality of an instructional package. For example, the outline calls for a motion picture film at a certain point in the teaching presentation. Perhaps even the film style and acting format is determined in the outline. You and the film expert select the final film from the films currently available. If the available films do not meet your expectations, you may need to design your own and have one made to order. These buy or produce decisions are made for all elements in the outline.




Theoretically, at this point, the builder will take delivery on the materials selected and will construct the house set forth in the architectural plans. Also, in theory, the buyer needs only to wait for the move-in date as determined by the builder. In reality, materials (even from the latest catalogs) are not always available when needed due to shipping problems, clerical errors and general human actions. Therefore, the buyer and the architect must maintain close and regular contact with the builder so that alternative materials can be selected which will maintain the integrity of the blueprints and the satisfaction of the buyer. In addition to materials, the artisans and crafts people building the house will make modifications in the blueprints based on their technical knowledge and whim. Therefore, the buyer and architect will regularly tour the building site and accept or reject the building serendipities.

Theoretically, at this point, the expert will purchase or produce the materials selected and will assemble the instructional package described in the strategy outline. Also, in theory, the teacher needs only to wait for the completion date as set by the experts. In reality, materials (even from the latest catalogs) are not always available when needed due to shipping problems, clerical errors, and general human actions. Therefore, the teacher and the instructional developer must maintain close and regular contact with the experts so that alternative materials can be selected which will maintain the integrity of the strategy outline and the satisfaction of the teacher. In addition to materials, the para-professionals and workers making materials will make modifications in the outline based on their technical knowledge and whim. Therefore, the teacher and the instructional developer must regularly inspect the materials and accept or reject the production serendipities.

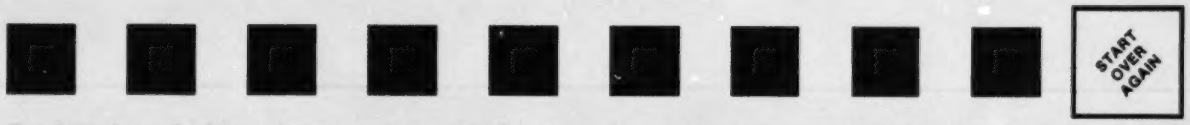
The dream of the past has become the reality of the present and you are ready to move into your new house. Assuming the adequacy of the architectural blueprint and the quality of the builder's execution of these blueprints, your move-in rapidly converts your empty house to a full home. Conversely, if the architect and/or builder inadequately interpreted you and your needs, the house may only become a home after modification.

The dream of the past has become the reality of the present and you are ready to try out your new instructional package. Assuming the adequacy of the instructionally developed st-ategy outline and the quality of the various experts' execution of this outline, your try out of this new instructional mode rapidly converts this sterile package into a comfortable successful teaching/learning situation. Conversely, if the instructional developer and/or paraprofessionals inadequately interpreted you and your class, the instructional package may only become a comfortable teaching/learning situation after modification.

You and your family are dynamic and changing. Your house is static and unchanging. As the static house and the dynamic family diverge, the early comfortable homey feeling is replaced with an uncomfortable fit. Depending on the nature of the changes in the family, minor or major modification will be needed to restore the house to a home. For instance, your business activities have changed and the room used to conduct this activity remains largely unused. Meanwhile your family has grown and your need for a family room has increased. Minor changes in the business room converts it to a family room and the comfortable homey "fit" is returned. As another example, your plan for a child is met with triplets. In addition you suddenly have a need to house an aged parent. Remodeling of the existing structure cannot meet the space needs of this expanded family. Therefore, an entire addition is required to return the family and house to a comfortable homey "fit." As a third example, your family has grown and left home and you have far more house than is needed. At this point no modification will recreate the comfortable homey "fit" and a decision is made to sell the structure.

You and your class are dynamic and changing. Your instructional package is static and unchanging. As the static package and the dynamic class diverge, the early comfortable teaching/learning feeling is replaced with uncomfortable fit. Depending on the nature of the changes in the class, minor or major modifications will be needed to restore the instructional package to a comfortable, successful teaching/learning situation. For instance, your unit on the solar system is outmoded by new discoveries resulting from space exploration. Meanwhile your class has become more sophisticated in the ways of space exploration from their own personal television viewing. Minor changes in the unit on the solar system by the substitution of a new videotape for an outmoded 16mm film converts the package from a dated concept to an exciting new experience for the class, and the comfortable teaching/learning situation is returned. As another example, your plans for a class of 18 students are met with a financial crunch in the school district, resulting in 40 students in your class, including five mentally retarded children being mainstreamed. Substituting a new videotape for an old 16mm film cannot meet the needs of this expanded class as you have only one TV set and they cannot all see it at once. Furthermore, mentally retarded children can't comprehend the totality of the package. Therefore, a major addition of one or more TV sets plus a set of remedial materials for those that fall behind is needed to return the class and the instructional package to a comfortable, successful teaching/learning situation. As a third example, your class

suffers from the zero population growth and drops to only eight children; the space program is discontinued in favor of a greater felt need of society for solutions to the energy problems. You now have an instructional package which is beyond the interest or needs of the class. At this point no modifications will recreate the comfortable successful teaching/learning situation and a decision is made to drop the unit from the class activities.




You have been looking at your current residence and have concluded that it is no longer adequate for you. You think you would like to build a new house of your own, but you again don't want a typical "tract" home. So you return to your trusted architect who once again determines who you are and who you have now become.

You have been looking at your current instructional package and have concluded that it is no longer adequate for you. You think you would like to build a new curriculum of your own, but you again don't want a typical commercial package. So you return to your trusted instructional developer who once again determines who you are and who you have now become.

# CHAPTER 3
# THOUGHTS ON COMMUNICATION THEORY

> "Once you and the instructional developer have agreed to work together, the instructional developer begins the process of determining what kind of a person you are and what kinds of students you will be working with."

What is so difficult about communication among people anyway? Why are there so many courses on such a simple thing? I talk and you listen - presto, we have communication; it's simple! For example, if I say, "I left my cat out all night" you know what my words mean, don't you?---- You're not sure?? You don't know what kind of cat I was referring to? Well, what difference does that make?

The difference becomes more obvious if we list just a few kinds of cats. Of course, there are Siamese, Persians and Angora; there also are lions, leopards and ocelots; and there are gossips, smooth operators, and tractors. Now it just happens that the "cat" left out all night could have been any of these, including the last one, a piece of earth moving equipment which would have been better protected from the weather if it had been put in a garage for the night.

"Well," you might say, "there are a few words that have more than one meaning." The fact is words themselves have NO meaning. People have meaning for words, and what I mean when I use a certain word may or may not be similar to what you may mean when you use the same word. In order to understand this concept, we really need to look at the process called communication.

What IS communication? A very simple definition is: The transfer of ideas from the thinking of one person to the thinking of another person. Actually, it would be more accurate to say "organism" rather than "person" in the above definition, but as our major concern is with human communication, we will generally think of people in the discussion that follows.

For communication to occur there must be at least two people involved. There may be more than two people but the one initiating the communication is the one who selects the way for the communication to get to those intended to be the receivers of the communication. To simplify the discussion, let us give names to some of the components of the communication process.

First there is the one initiating the process; we shall call this person the communicator. (Notice that the ending is -or, which is a suffix used to change a verb to a noun.) There is the one (we shall, in our examples use the singular, although more than one CAN be involved) who receives the communication; we shall call this person the communicatee (The suffix -ee designates the recipient of an action). There is the channel which is chosen to appeal to the sense receptor most likely to be effective in a given situation. There is the medium which is the particular item that transmits the communication from the communicator

through the chosen channel to the communicatee. There is the message which is the idea being transmitted and there is feedback which is really a secondary message flowing in the opposite direction.

Let us analyze these components more closely. Certain characteristics of both the communicator and the communicatee bear especially close scrutiny. Each party possesses a well-developed battery of communication skills. Of paramount importance is the similarity or dissimilarity of the skills. For example, if the communicator speaks in English, but the communicatee understands only Swahili, there is an obvious barrier to communication. If the communicator chooses to communicate by speaking when the communicatee is deaf, there is another obvious barrier. One important criterion for communication to be successful is that there be the proper relationship between like categories of skills for the communicator and the communicatee, i.e., there is no sense in showing a picture to a blind person. Included among the communication skills, along with the components of speaking/listening, writing/reading may be included and such other skills or modes as gesturing, singing, dancing, painting, drawing, using a camera, and numerous other modes by which the communication may be transmitted and perceived. In each case, whatever communication modes the communicator elects, the communicatee must be able to receive the message through the appropriate proprioceptors and understand the stimulus being received.

A second characteristic of both the communicator and the communicatee is their knowledge about the subject under consideration. Again the similarity or dissimilarity of their knowledge about the subject is of vital importance to the success of the attempt to communicate. If an adult with highly developed skills in algebra, trigonometry and calculus attempts to explain these concepts to a child who has not yet mastered the multiplication tables, there will most likely be a breakdown in the communication attempt. Of course, the reverse is also true if the communicator talks below the knowledge level of the communicatee; boredom and/or a sense of being put down may prevent the communicatee from paying attention and again the communication may breakdown. There must be an awareness on the part of the communicator of the knowledge level of the communicatee and an effort made to harmonize differences.

The attitudes each party brings to the communication situation is a third characteristic which influences the success or failure of the process. Specifically, the attitudes each holds about the subject under discussion, about each other, and about the other components of the situation will facilitate or hinder the process. Attitudes are the results of past experiences and so if the parties to the communication have extremely diverse cultural backgrounds and socioeconomic environments, there is a better than average chance that communication may suffer.

Another component of the process is the channel selected by the communicator. S/he may select any one or any combination of the five physical senses (seeing, hearing, smelling, touching, or tasting) as the most appropriate channel(s) to maximize chances of delivering the optimum message. For example, a verbal or even pictorial description of the flavor of a lemon simply does not as fully convey the message as giving the communicatee a taste of the lemon.

The medium chosen to carry the message from the communicator to the appropriate sense of the communicatee is still another component of the process. To repeat the example of the lemon, if the logical decision is made to give the communicatee a taste, the choice of medium still must be made from such possibilities as serving a whole lemon, a lemon slice, lemon juice, or lemon flavored frosting on a cake. Each will generate a different response in the communicatee.

The message to be conveyed is also a vital component of the process (in some ways it may seem to be the most vital, but actually all components are interdependent and none can function in isolation). The message itself is composed of several sub-components. In order to frame a message which can be successfully transmitted one must encode the idea which first exists as a feeling before the communicator has even thought of it. Depending on one's skills, on one's perceptions of the situation in which one plans to attempt the communication, and on the analysis of the characteristics of the communicatee, one may select any of the numerous modes of encoding available. These modes include the possibilities of language (words to say or write), choreography (dance steps to express the idea), music, painting or drawing, and several other techniques which can express the ideas. One must give consideration to the content which is to be encoded. The content is the essence of the idea, the whole purpose of the communication, the thing you hope to transfer from your thinking to the thinking of others.

The communicator has to make decisions, such as, what code will be most effective, what content will be appropriate, and should there be some combination of codes used for greater impact? As these decisions are made, the way the message is treated is varied according to the communicator's perceptions of the situation and a decision has been made as to the best treatment of the message. The treatment may be formal or informal, simple or complex, and/or many other things, but it is always the treatment perceived to be the best in the immediate situation. Frequently, after some time span (maybe almost instantaneously) the perception may alter indicating a different treatment may have been superior, but that only can affect a future message.

Each message, then, must be encoded. This selected code is composed of various elements (the sounds that make up the words) which are strung together in some structure (the words make up sentences).

The final component of the communication process to be considered is feedback. It is the vital essential to any hope for success in the process. By feedback, we refer to the reverse flow of a message. It may be spoken words, or may be only subtle cues which the communicatee emits such as facial expressions, posture, gestures, etc., which, when received by the communicator, afford him/her a measure of how successfully the initial message was received. In effect, the communicator and communicatee switch roles during this interval, and as can be imagined, during a rapid-fire interchange of ideas, the participants are reversing roles rapidly and continuously.

With the major components of the process identified, it now is necessary to discuss the relationship between the two participants. Both the

communicator and the communicatee have lived somewhere, had certain feelings, desires, frustrations, pains, and other experiences which have made them what they are. Their view of the world, of the situation in which they now find themselves, of each other, and indeed, of the communication itself is colored by these experiences. Their perception of the immediate point under discussion is, thus, affected by their individual fields of experience. As no two people ever can have identical fields of experience, neither can they have identical perceptions of any single situation. As the hope for successful communication is based on the commonality of experience, and as it is clear from the foregoing that complete commonality of experience is impossible, we must conclude that communication is impossible. "But," you may say, "I know that is wrong because I communicate with others all the time." This is true but to understand how this is possible, we must add one more factor to the discussion. It is necessary to consider the overlap of these individual fields of experience. While it may be true that no two people can have identical fields of experience, it is also true that in many events there can be a common sharing of experiences. If we both see a certain motion picture, we will come away from it with some degree of commonality. It may be true that we may perceive different things in the film in different ways, but we WERE exposed to the same stimuli and some degree of commonality must result. The more experiences that are shared by two people, the more their perceptions will be similar and the greater the chance for successful communication.

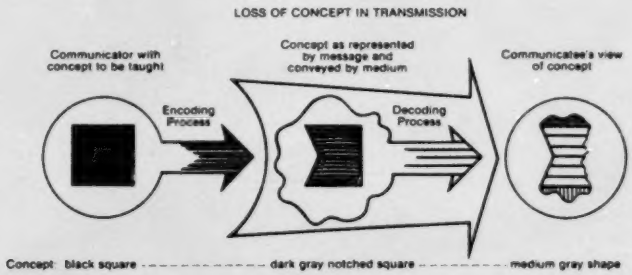
For example, suppose a gentleman is obsessed with a particular idea of something he would very much like to accomplish. Suppose he goes about doing what is considered to be "usual" activities but the vital project is always on the fringes of thought. Suppose he, because of the continued contemplation of the project, does some things differently than usual or does them in a way which some other individuals consider "odd." What do you suppose various strangers viewing our "obsessed" gentleman may think of him? You can be assured each viewer will give a different interpretation to the observed activities. One may view him as preoccupied or thoughtless. Another may view him as secretive, maybe even criminal. A third may assume him to be immoral. Still another could assume him to be insane or at least not in complete control of his mental processes. Finally, someone else could assume him to be an obvious murderer. If we could examine the thoughts, motivations, activities and feelings of each of these viewers, we would find that each of them may have had experiences in his/her private life which causes perceptions of the "obsessed" to be colored by his/her own previous experiences and thus, conclusions are as described. Truly, the view of the gentleman with the obsession is altered by the eye of the beholder.

Finally, we must tackle the place of the word "meaning." In the example used at the beginning of this article, a rather common question which an alert communicatee may ask of the communicator is "What do you mean by 'cat'?" Notice we are not asking that the word "cat" be defined, but rather we are asking what the speaker means when s/he uses the word. This question is asked because (due to the individuality of perceptions and the resultant experiences) an alert communicatee will seek to increase the area of commonality of his/her field of experience with that

of the speaker by determining what, if any, common experiences each party to the communication may have had. If the communicator does the same thing before starting, or permits feedback to assure commonality, s/he can feel confident that the communication is succeeding.

However, if the two participants in the communication fail to search out each other's meaning for a particular word or phrase, they may suffer a communication breakdown as a result of "bypass." Literally, this means they may talk past each other. If I say "cat" meaning a bulldozing tractor and you hear "cat" and think of a small pet animal, we are bypassing.

Another cause of communication breakdown is the presence of "noise" in the system. Here we refer to any additional stimuli which may mask or distort the proper stimuli. Such "noise" can be introduced anywhere in the process. The communicator may select a poor code for his/her idea. The improper code will modify the original idea to a smaller or greater degree. The coded idea, when committed to some medium, may be further modified by weaknesses in the medium. The channel selected may not be the best for the communicatee resulting in further loss of the original idea. Finally, the decoding process in the thought of the communicatee may further modify the idea because this person applies a different meaning to the words than were originally intended. The following model illustrates the ideas just presented.


LOSS OF CONCEPT IN TRANSMISSION
Communicator with concept to be taught
Concept as represented by message and conveyed by medium
Communicatee's view of concept
Encoding Process
Decoding Process
Concept: black square
dark gray notched square
medium gray shape

First, the communicator may be hampered during the encoding process in the attempt to find a code which can fully encode the idea. If the communicator has in mind a black square but knows the communicatee understands only a different language than English, the code selected may be a quick sketch done with pencil and paper. Unfortunately, pencils usually do not produce pure black, so immediately the concept is changed. Furthermore, unless the communicator takes time to use some device to produce perfect right angles and straight lines, the shape will probably not be a true square. By the time the message is committed to some medium, it has already been slightly distorted.

Second, let us suppose the communicator holds the paper up for the communicatee to see the "black square." It so happens, light reflects off the surface strangely and the gray pencil marks are further lightened and appear to be just a medium gray. Furthermore, the "square" may be further distorted by the angle at which it is observed.

Then the communicatee, perceiving the shape and basing his/her perception on previous experiences, may assume the shape to be a slight

distortion of some shape s/he knew from before and so adds to the sketch the "missing" elements and thus "sees" an irregular medium gray shape when a perfect black square was intended.

The distortions or losses that occur during the process of transmitting a communication can result from many factors, some, but not all of which, follow. In the encoding process, the communicator may be inaccurate in measuring the communicatee and select an inappropriate, or less appropriate code than might have been selected. Even the best code may simply be inadequate to convey the idea correctly. The medium chosen to carry the encoded message may be inadequate or may permit the introduction of "noise" (factors which mask or distort the intended message). The channel selected may be inappropriate or may involve delays or other distortions such as the spoken word being presented to a hearing impaired communicatee. Finally, the decoder may miss some more available information and further will always modify the encoded message in light of the communicatee's own past experiences.

The reader may question what all of the preceding discussion has to do with the process of teaching and formal education. It should be patently clear that communication and the processes and procedures which enhance success in communication are the basic root which makes possible the process of education. Without the ability to communicate, no education would be possible, or at least no education in the traditional sense would be possible without the usual forms of communication. If communication then is so basic to education, it should be obvious that knowledge of the communication process should greatly enhance the process of education.

The first step which a successful communicator considers is the similarity or lack of similarity between himself/herself and the audience being considered. Questions to be answered specifically are enumerated in the next chapter but the reader should be fully cognizant that familiarity with as much about the audience as can be determined, knowledge of prejudices, attitudes, skills, and abilities are the ingredients in the step known as audience analysis. The educator/communicator/instructional developer must first analyze the audience (including what they now know about your subject) and then determine what they should know about the thing you desire to communicate.

Then, we may ask, do we always perceive or understand what is communicated? And we can answer, that of course we do not, but we can, if we make the effort, understand sufficiently and frequently enough for us to get along most of the time. Yet we also know that in our every conversation much that is intended fails to be communicated.

Examples of failures to communicate abound and are even the subject of many books. Translations from one language to another provide many easily seen illustrations of instances in which the different idiom produces what are humorous statements. "Throw the cow over the fence some hay," may sound peculiar to a native speaker of English, but the word order is quite natural for those using Germanic languages. The new Swedish immigrant says, "Make da boat come by da dock, pretty tall vatter here and I no can swim anything." The American teenager may

refer to any means of transportation as "wheels". These examples show the varying attempts to communicate by people who are different in ability, culture, or custom.

Failure to communicate what is in our thinking results from not saying what we mean or from not understanding what is said. Understanding is based on experience. Lack of experience among children gives rise to several examples of communication breakdown:

.....Little Johnnie was in Sunday school listening to his teacher tell how Lot and his family left Sodom. As they left the burning town Lot's wife looked back and she was turned into a pillar of salt. Little Johnnie raised his hand and volunteered a newer example based on his experience, "The other day mama was driving out of the parking lot. She looked back and she turned into a telephone pole." Did the teacher communicate the CORRECT concept?

.....Consider the little girl who came in from playing and said to her Mother, "Where did I come from?" Her mother responded by telling the child about the facts of life and then summed it up with the question, "Now do you understand?" Her daughter sighed and replied, "Well, I guess so; Suzie said she came from Chicago and I just wanted to know where I came from." Do our communications fulfill a NEED?

.....Finally, there was a church elder who asked a Sunday school student, "Who knocked down the walls of Jericho?" The child immediately answered, "It wasn't me. I was at a party with my friends." Are our communications being UNDERSTOOD?

Adults are just as prone to misinterpretations as are children.

.....A police officer stopped a car and asked the driver, "Have you driven a car before, and how long?" The answer came, "Yes, I've driven before, and the car was fifteen or eighteen feet long." Are WE REALLY communicating?

.....The teacher asked the young boy to name the seasons of the year. The young man answered, "Hunting season, fishing season, swimming season, and skating season." In our communications our PERCEPTIONS differ.

.....A letter received recently was addressed:

Dr. Jayne Q. Doe
123 MacArthur
Macomb, Illinois 61455

Dear Dr. MacArthur:

Are we CAREFUL in our communications?

.....A student brought home a very good theme, but it was marked "C." Feeling their child has been unfairly discriminated against, the parents were calling the teacher when the sheepish scholar produced a cover page

on which the teacher had written, "Excellent theme, but ten days late." Have you ever been guilty of communicating only the PART you desire?

.....A child, asked the usual question, "What did you do in school today?" responded with, "Nothing." Knowing something of teaching and schools in general the reader will quickly ascertain that it was probably a day very full of activity but the child, in his/her desire to get out and play, did not wish to delay and so the short negative answer seemed to be one which would end the discussion. Is there a LACK of communication?

We must be conscientious to weigh our attempts to communicate and even more so to weigh what is communicated to us. We must look for CORRECTNESS of concepts, fulfillment of NEEDS, whether we are being UNDERSTOOD, if our PERCEPTIONS may differ, if the communication is COMPLETE, whether the communication was prepared CAREFULLY, if the communication may be only PARTIAL, and why there may be a LACK of communication. Look for the purpose, determine the problems, analyze the communicator and the communicatee and determine what are their differences and how to overcome them. Then with a little luck and a lot of effort, we may find our communication improving.

An enlightened teacher communicates and an enlightened student perceives what is being communicated.

# CHAPTER 4
# AUDIENCE ANALYSIS

> "S/he will ask questions such as how many students are in the classroom now and how many there will be 5, 10 and 15 years from now, what are the ages of the students, and are there any physical limitations which might affect the mobility of the students, how well can these students read, write, talk, and listen, and what are the students attitudes toward certain types of learning materials. The instructional developer will also ask questions about the social status of you and your students as well as the students' economic status. Other factors considered include ethnic backgrounds, preferred teaching and learning styles and a whole host of things which make you and your class a unique set of human beings."

As mentioned in Chapter 3, the communicator/educator/instructional developer (or can we say teacher?) must give consideration to the communicatee. In the desire to maximize the efficiency of the transmission, it is essential that as many barriers to successful transmission as possible are removed.

What are the characteristics of the audience? What factors will influence the transmission of the communication? What can we find out about the audience? The factors alluded to in Part One include knowledge of the subject under consideration, attitudes about the subject, the other people involved in the situation and the level of communication skills.

We have indicated the need to harmonize differences which may exist between the parties involved in the communication. This does not mean that each party must have equality in each of these factors; it simply means that consideration is given to the differences and an attempt is made to work within the limits of the other party's capabilities. For example, consider the factor of communication skills. A sincere communicator will know, before the communication is attempted, whether the communicatee will be best served by a verbal, visual or tactile display. S/he will know at what vocabulary level the verbal display could be understandable to the communicatee. S/he will know how visually literate the communicatee may be. S/he will know if the only way the communicatee can "get the message" is through manipulation of some object or otherwise touching something related to the message.

Similarly, with the factor of knowledge, the communicator must consider how much knowledge the communicatee has in regard to the subject being discussed. It is obviously necessary that the ideas being communicated are basically within the knowledge range of the communicatee. Of course, ideas can go beyond present knowledge (or how else could we learn?) but the degree of advance must be just right, too much will lose the audience, and too little will be no challenge.

Attitude is, perhaps, the most easily overlooked factor and yet may be the most important. Differences in attitude about the subject reflect broader differences that may exist about life in general and specific actions in seemingly unrelated matters in particular. For example, a student may insist on wearing a hat in class. This may seem like a matter which is unrelated to the teaching/learning situation in the classroom and so the teacher may demand removal of the offending garment. The student may sullenly acquiesce but thus develops an attitude of resistance to whatever the teacher has to communicate. The teacher has not given adequate consideration to the differences in attitude which exist between himself/herself and the student. From the student's point of view, the importance of the offending hat may be in reaction to the need for peer approval and feelings of need for some show of independence. Really, what difference does the hat make, anyway. The teacher's cultural background has inculcated in him/her the belief that wearing a hat indoors is improper and failure to remove the hat is a mark of disrespect. The teacher's own insecurity may need this outward mark of respect. Thus, the teacher is just as much in need of a sense of importance as the student. How much better the possibility of good communication if each party can learn to understand the needs of the other and ignore the trivia.

Taking into account all of the differences which may exist between the communicator and the communicatee, the successful communicator has actually performed the act of analyzing the audience. Knowing their skills, knowledge levels, and attitudes, the teacher has determined "entry behavior." That is, s/he knows what the learner can do in relation to the subject under discussion and what desirable changes in the learner's behavior will indicate successful learning. S/he has determined entry behavior and is measuring that against the desired terminal behavior.

In the next chapter, we will devote effort to the establishment of ways to properly state terminal behaviors. When both entry and terminal behaviors are known and the differences are measurable, it becomes the task of the teacher to determine what must occur to the student for him/her to get from entry to terminal behavior.

# CHAPTER 5
# OBJECTIVES

> "Now that the instructional developer knows who you are, s/he needs to determine what activities are going to go on in this classroom. For instance, if you regularly teach children physical skills, the type of skills taught will determine the size, location and arrangement of this activity. If you teach mathematics, this subject will determine the number of chalkboards, computers and other math tools that will be needed. S/he will try to set the educational outcomes (behavioral objectives) in as exact a terminology as possible."

As we saw above, the audience analysis gives us a statement of who the learners are and what potential they have for learning. It also describes what the learners currently know about the subject. The purpose of this step in the ID process is to determine where the class or individual learner is to end up. This determination is based on what they currently know as well as their potential for change. (We define learning as change in behavior.) All persons in the class must progress as far as they are capable of going. To this end we can set individual, as well as class goals.

An effective goal statement, or behavioral objective, or end result, or any other finishing statement, must clearly state three things to both the learner and the teacher. It must clearly tell what the learners must do to prove that they have learned the material. It must give the situation and condition under which the person will do the proving as well as tell them both what is an acceptable performance.

There are only three ways that someone can prove to you that he/she has learned something. These are: to say the information, write the information, or perform an act. When choosing words to describe what the learner will do, it is most important to state specifically the manner in which the student will do the proving. For example, if we want a student to know the six steps of operating a 35mm camera, the only way a student can prove to us that it is known is for the student to write the six steps of operating a 35mm camera or recite the six steps of operating a 35mm camera or actually operate the 35mm camera using the six steps. In each of the above the student has an idea of what is expected of him/her and can begin to prepare for the task. Neither the teacher nor the student is limited to only one way of showing learning. We could suggest that the student can prove learning by both saying each of the steps and operating the 35mm camera.

Confusion sets in when teachers and students only have a vague feeling of what is expected of them. How often have you heard students say they had no idea what the teacher wanted or that the teacher is always changing the way he/she expects the students to prove their knowledge. It is wise, therefore, to avoid the use of words such as become able to, appreciate, enjoy, etc. (see Chart 5-1) and to concentrate on specific statements such as write, construct, alter, sing, list, etc.

CHART 5-1
BEHAVIORAL OBJECTIVE VERBS

The following list of verbs are useful in the construction of behavioral objectives that clearly state what the learners are to do in order to prove their learning. Some of the words in this chart are vague and will need to be modified by the addition of "orally", "write," or "perform", (i.e.) orally analyze is different from analysis in writing while analysis by performance would be extremely difficult.

Arts Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Assemble | Cut | Frame | Mold | Roll | Stamp |
| Blend | Dab | Hammer | Nail | Rub | Stick |
| Brush | Dot | Handle | Paint | Sand | Stir |
| Build | Draw | Heat | Paste | Saw | Trace |
| Carve | Drill | Illustrate | Pat | Sculpt | Trim |
| Color | Fold | Melt | Pour | Shake | Varnish |
| Construct | Form | Mix | Press | Sketch | Wipe |

Complex, Logical, Judgmental Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Analyze | Compare | Criticize | Defend | Formulate | Infer |
| Appraise | Conclude | Decide | Evaluate | Generate | Plan |
| Combine | Contrast | Deduce | Explain | Induce | Structure |

"Creative" Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Alter | Generalize | Question | Regroup | Rephrase | Rewrite |
| Ask | Modify | Rearrange | Rename | Restate | Simplify |
| Change | Paraphrase | Recombine | Reorganize | Restructure | Synthesize |
| Design | Predict | Reconstruct | Reorder | Retell | |

Drama Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Act | Display | Express | Pantomime | Proceed | Sit |
| Clasp | Emit | Leave | Pass | Respond | Start |
| Cross | Enter | Move | Perform | Show | Turn |
| Direct | Exit | | | | |

General Appearance, Health and Safety Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Button | Cover | Empty | Lace | Unbutton | Wait |
| Clean | Dress | Fasten | Stop | Uncover | Wash |
| Clear | Drink | Fill | Taste | Untie | Wear |
| Close | Eat | Go | Tie | Unzip | Zip |
| Comb | Eliminate | | | | |

## General Discriminative Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Choose | Describe | Discriminate | Indicate | Match | Place |
| Collect | Detect | Distinguish | Isolate | Omit | Point |
| Define | Differentiate | Identify | List | Order | Select |

## Laboratory Science Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Apply | Decrease | Increase | Manipulate | Replace | Straighten |
| Calibrate | Demonstrate | Insert | Operate | Report | Time |
| Conduct | Dissect | Keep | Plant | Reset | Transfer |
| Connect | Feed | Lengthen | Prepare | Set | Weigh |
| Convert | Grow | Limit | Remove | Specify | |

## Language Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Abbreviate | Capitalize | Print | Say | State | Translate |
| Accent | Edit | Pronounce | Sign | Summarize | Verbalize |
| Alphabetize | Hyphenate | Punctuate | Speak | Syllabicate | Whisper |
| Articulate | Indent | Read | Spell | Tell | Write |
| Call | Outline | Recite | | | |

## Mathematical Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Add | Count | Extract | Measure | Prove | Subtract |
| Bisect | Derive | Graph | Multiply | Reduce | Tabulate |
| Calculate | Divide | Group | Number | Solve | Tally |
| Check | Estimate | Integrate | Plot | Square | Verify |
| Compute | Extrapolate | Interpolate | | | |

## Music Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Blow | Compose | Hum | Pluck | Sing | Tap |
| Bow | Finger | Mute | Practice | Strum | Whistle |
| Clap | Harmonize | Play | | | |

## Physical Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Arch | Climb | Hit | March | Ski | Swim |
| Bat | Face | Hop | Pitch | Skip | Swing |
| Bend | Float | Jump | Pull | Somersault | Throw |
| Carry | Grab | Kick | Push | Stand | Toss |
| Catch | Grasp | Knock | Run | Step | Walk |
| Chase | Grip | Lift | Skate | Stretch | |

## Social Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Accept | Argue | Dance | Greet | Laugh | React |
| Agree | Communicate | Disagree | Help | Meet | Smile |
| Aid | Compliment | Discuss | Interact | Participate | Talk |
| Allow | Contribute | Excuse | Invite | Permit | Thank |
| Answer | Cooperate | Forgive | Join | Praise | Volunteer |

## "Study" Behaviors

| | | | | | |
|---|---|---|---|---|---|
| Arrange | Classify | Follow | Look | Note | Reproduce |
| Categorize | Compile | Gather | Map | Organize | Search |
| Chart | Copy | Itemize | Mark | Quote | Sort |
| Cite | Diagram | Label | Name | Record | Underline |
| Circle | Find | Locate | | | |

The second part of a good meaningful and useful goal statement tells the learners the conditions under which they will prove their learning. It is not enough for a person to know that s/he must say the six steps of operating a 35mm camera because he/she may plan to stand at the teacher's desk and quietly say the steps while the teacher may expect him/her to stand in front of the room and say it to the whole class or even to a school assembly. We are certain that you will agree that there is a whole world of differences between the act of saying the six steps to a teacher and saying the six steps to a school assembly. Each requires a different type and amount of study as well as psychological effort on the part of the student. Again, asking a student to write the six steps as a part of homework is different than an essay exam on the six steps or a true/false test on the six steps. It even makes a difference if the test is timed or untimed. In each case a different amount and kind of study is required. The learner then must be informed as to when and how s/he will be expected to prove this knowledge. Our goal statement would now read "The learner will list the six steps of operating a 35mm camera on a written ten minute exam."

When the students do not know the type of exam a teacher will use, they cannot study efficiently or effectively. Research indicates that students always do better on the second exam in a class because they have a clearer understanding of what a teacher is looking for and how the teacher will go about getting the information. How much better for the learners if they know right from the start what they will have to do to show their learning and the situation under which they are to show this learning.

The third, and final aspect of a good goal statement gives the learner a firm idea of what an acceptable performance is. This can be expressed in many ways, such as 89% correct is a B, or the picture will use the rule of thirds, or the knot will withstand a force of 500 pounds or the action will be repeated six times without error. Our goal statement would now read in its final form "The learner will list the six steps to operating a 35mm camera on a written ten minute exam with 100% accuracy." Now the student can judge how to study for this test and what is required to pass. S/he does not have to guess or hope that five out of six is good enough or even if s/he had studied the right items.

Educational goal setting can and should be both individual and progressive. Individual in the sense that as each person is unique, each expectation should be a reflection of that uniqueness. This is, of course, based on the first step in the process, namely the audience analysis and a statement of where the learner is today.

Successful performance can also be judged differently at different stages in the learning process. For instance, using our 35mm camera example, a picture would be judged acceptable in the first shooting assignment if it was in sharp focus and was properly exposed. Later in the course acceptable performance might include these two elements, but be judged only a fair or poor picture if other elements such as rule of thirds, depth of field, color and use of a size scale were omitted.

In the construction of goal statements, it is a good idea to remember that more is better. The more clearly you can point a learner toward the desired learning outcomes, the greater the chances are that the learning will occur. The more specific statements that you can provide the learner the more readily s/he can apply him/herself to the task and not waste time on needless or counter productive activities. The more you think through the desired learning outcomes, the easier it will be for you to select the educational tools, devices, and examples that assist the learner in the whole process of learning. After all, the whole concept of school is for learners to learn.

One of the saddest memories one of the authors has is when he spent three weeks teaching ninth graders the process of finding X% of a given number. All of the many examples and pages of practice problems were done on workpages with problems set up. All the student had to do was the math calculations. On the test 20 word problems were given which resulted in a class average of about 20% correct. Oh, how the students were chewed out for failing to learn. How WRONG the author was. Now the author sees that the test was not on what was taught but on a different set of goals. The test or performance must be a reflection of the learning outcome sought. At the time the test had been justified on the grounds that they could do the math, but now he wanted to see how well they could apply the math to real life. How often have we tested for transfer of training without guiding the transfer? The goal statement, then, must keep both the teacher and the student pointed toward the educational outcome and we must remember to only ask the student to prove knowledge of what was to be learned, not some hidden agenda. We must keep the educational goals "up front."

Following are several examples of goal statements that meet the three criteria set for such statements:

EXAMPLE #1 - Your educational goal is to have a student read Chapter Six of the textbook. How can a student prove to you that the chapter was read? If all that you told the student was "read Chapter Six", s/he would have a difficult time deciding what to emphasize. If, for instance, you gave an exam and asked for the ten dates listed in the chapter and the student got eight wrong, you might conclude that the chapter had not been read. This may or may not be a valid conclusion as the student may have learned the names of the ten people mentioned in the chapter and not looked at the dates. All your test proved was that the student had not learned the dates, not whether the chapter had been read. It would be much better to give the assignment goal as follows: On a written ten minute exam match the names of the people with their date of birth with 80% accuracy. This tells the student that s/he is responsible for both the names of the people as well as their date of birth. S/he also knows that sight recognition is sufficient rather than learning to recall and that eight out of ten will be passing. As a student you can now read Chapter Six and know with confidence that you will be getting the information requested and required by the teacher.

EXAMPLE #2 - Your educational goal is to have a student operate a 16mm projector. How can the student prove to you that s/he can operate the projector? In this case the only way that the student can prove his/her

ability is to set up and run the projector. A written or oral exam cannot get at the educational goal as it measures something other than machine operation. Your goal statement could now read, "You will operate a 16mm projector in the classroom, during class with all students present and have the projector focused with appropriate sound levels within three minutes." Once again the student knows how to prepare for this demonstration of his/her ability to run the projector. It is different than a goal statement that would have the projector running in a study carrel or in a 700 seat auditorium or within two minutes or even the ability to do the task in a darkened room.

EXAMPLE #3 - Your educational goal is to have the students appreciate good music. This is virtually an impossible task. Even if we could agree on what is "good" music, we need to ask what will a student do to show appreciation? We could suggest the purchase of disc or tape recordings, but would such lack of purchase be lack of appreciation, lack of money, or both? We could suggest increased attendance at musical events, but to do this we need some baseline data of previous attendance and would attendance prove appreciation? We doubt it. We could suggest applause as a way of showing appreciation, but does lack of applause mean lack of appreciation or on the other hand does applause truly mean appreciation or group pressure? Do you applaud a disc recording to show appreciation? This example is one where we are not certain how the goal can be measured. We suggest that any appreciation course is a mislabeled course since the knowledge gained can only infer appreciation. It would be better for these courses to state more concrete learning outcomes and drop the word appreciation. (We do not have a quarrel with courses that teach students about art, music, etc., but we do quarrel with the terminology used to describe the courses.)

EXAMPLE #4 - The educational goal is to spell the 20 word spelling list. Several examples are given to show how the same goal can be written in different ways and still meet the criteria for a behavioral objective.

1. "Orally spell the 20 word list with 85% accuracy to the teacher at his/her desk after the teacher says the word twice."
2. "Write the correct spelling on paper with 100% accuracy, using ink, with the teacher reading the words."
3. "Write the correct spelling to a random selection of ten words with 90% accuracy on the chalkboard, with a tape recording reading the words."
4. "Say a sentence containing one word of the spelling list to the class with the word correctly used."
5. "Write the 20 word list on paper, from memory, with 19 to 20 correct an A, 17 to 18 correct a B, 15 to 16 correct a C, and zero to 14 correct remaining after school until the list has at least 15 correct."
6. "Write the words in alphabetical order, at home with the spelling book open, with 100% accuracy."
7. "Correct the spelling of the words on a teacher prepared sheet, in ten minutes during class with 90% accuracy."
8. "Type the words on a typewriter with 100% accuracy, eyes blindfolded, with a tape recording reading the words at a rate of ten per minute."

9. "Say the word to the class with 95% accuracy when a definition of the word has been read by the teacher."
10. "Identify the words as a noun or verb by drawing a circle around all nouns and a box around all verbs with 80% accuracy."
11. "Draw a red circle around each of the words from the spelling list on an article taken from a daily newspaper. Work in pairs for six minutes and identify 60% of the words."
12. "Draw a red circle around each of the words from the spelling list on an article taken from a daily newspaper. Work in pairs for ten minutes and identify 95% of the words."
13. "Draw a circle around each of the words from the spelling list on an article taken from a daily newspaper. Work at home, alone with 100% accuracy."
14. "Cut out newspaper ads that contain at least one of the spelling words. Circle the word in the ad. Bring ten ads to class tomorrow."
15. "On Monday print the spelling words on your paper, in ink, during class with 50% accuracy."
16. "On Wednesday print the spelling words on your paper, in ink, during class with 80% accuracy."
17. "On Wednesday write the spelling words in cursive on your paper, in pencil, during class with 50% accuracy."
18. "On Friday print the spelling words, on your paper, in ink, during a ten minute test with the teacher reading each word twice. Twenty correct is an A, 18 to 19 correct is a B, 15 to 17 correct is a C, 12 to 14 correct is a D, 11 or less correct is an F."

# CHAPTER 6
# IDEAL STRATEGIES

> "Using the knowledge gained in the previous interview, the instructional developer begins to list the various teaching strategies that might have a bearing on the behavioral objectives. These strategies are tentative and the advantages and disadvantages of each are discussed with you, the teacher. You, based on your own feelings and in consultation with others, determine which strategies appear to best match you and your students."

All right, you have determined where the student is and where you want him/her to go. Now you must determine what activities are best able to change the entry behavior into the desired terminal behavior. You must consider many things, but it probably works best to dream without the restrictions imposed by reality. If you could have and do what you want to, what would you do? What strategy or strategies would be most likely to succeed?

In order to study the strategic opportunities that could do the job, we must discuss what strategies exist. One of the best statements of the strategies which exist is made by Edgar Dale in his model denominated the "Cone of Experience." This model has made a major impact on many practitioners in the field of education including the authors of this treatise. The strategies available to teachers can be seen in the various levels of the cone. Whether a teacher chooses to have children in a cooking unit read pastry recipes, watch a film on how to make an apple pie, or go into a kitchen and actually prepare the real thing is a matter of strategies.

Other models have been put forth to show the strategies open to the teacher. S/he may elect to lecture to the student, may elect to provide some independently operable medium (such as a motion picture film) to present the ideas, or may elect to combine the lecture with some other medium. Thus, the ideas may be presented by the teacher alone, by media alone, or by the teacher using media.

These models suggest the need to analyze what we mean by media. You will recall from Chapter 3 that a medium was defined as "the particular item (component in the communication process) that transmits the communication from the communicator through the chosen channel to the communicatee." Examples of media include: (1) the written and the spoken word, (2) visual symbols (usually pictorial representations of reality bearing different degrees of abstraction), (3) audio recordings, live sound (from an unseen source), and photographs (without sound accompaniment), (4) moving pictorial displays (either pre-recorded, or live), (5) observation of working models and mock-ups, (6) study trips, (7) demonstrations, (8) play-acting, oral readings, pageants, (9) manipulation of models and mock-ups, (10) the construction or production of an actual product. Obviously, this brief list barely scratches the surface of possibilities; however, a quick reexamination of the list will illustrate the three major categories of media available to teachers: (1) media requiring the ability to translate symbolic materials into some idea of what the symbols represent, (2) media which are useful by more or less passive observation, and (3) media which directly involve the communicatee in some active process, which force the communicatee to DO something.

How does the teacher choose the appropriate strategy or strategies? Let us return to our basic communication model. We need to select those media which will most efficiently transfer the idea through the channel most appropriate to the situation. For example, if an industrial arts teacher wishes to communicate to a pupil the correct way to hold and manipulate a wood gouge, among many strategies may be the possibility of simply demonstrating. The teacher simply shows the child how to hold the tool, how to properly and safely brace the tool, how to move the tool into the block of wood revolving on the lathe, how fast (or slow) the operation can be done, and what safety precautions are to be considered. However, as might quickly occur in the mind of the reader, so too, a problem might arise for the pupil if no verbal explanation accompanies the demonstration. The teacher would most likely elect to talk while demonstrating; but another problem may arise if the class is composed of 30 children. They probably could not all see the demonstration easily, and worse may not even be able to hear it adequately. If the teacher attempts to solve this problem by giving several demonstrations to five or six pupils at a time, it may take the entire class period to reach all of the children and there would be no time left for the pupils to practice the skill.

The teacher may elect to mount a series of still pictures accompanying explanation above each student's work station which illustrates the correct process which can present the same ideas which would have been presented orally. The likelihood of the pupils reading all of the written material is, however, unlikely. Children, in their enthusiasm to "try to do it" will simply take the gouge in hand and push it into the revolving block of wood. Splintered work pieces, flying gouges, and possible injuries all are potential outcomes of such a strategy.

What is the teacher to do? One very effective strategy (although a high-priced method) observed by one of the authors was the use of closed-circuit television. By mounting a camera where it could transmit

a view just over the shoulder of the instructor, the pupils could see on several video screens almost the identical view which they would have when they attempted to duplicate the skill. The view and the sound were available to all at one time, no reading was required at this point, and as soon as the demonstration was over, each pupil could try to do what was just presented. The instructor had also provided the series of still pictures and verbal accompaniments mentioned earlier. When confusion entered the mind of any individual child, a quick reference to the pictorial/verbal display was adequate to solve most problems.

This rather lengthy example serves to illustrate several points in the theoretical portion of this chapter. (1) The successful teacher combined several different media to arrive at the strategy which worked. (2) Dreams of "expensive" solutions may suggest alternatives worthy of presentation to administrators and fiscal agencies. (3) Involving the learners in different modes of learning (doing, observing, and using symbolic materials) opens the mind of each learner by use of the mode or combination of modes most suitable to the individual.

## CHAPTER 7
## PRACTICAL STRATEGIES

> "Having determined the best teaching strategies for meeting your educational objectives, the instructional developer begins the process of outlining the specific media materials and methods which will best serve the desired strategies. Depending upon the size of the school system, many other people (reflecting many specialties) will contribute to various aspects of the outlining. Separate outlines will be prepared for book orders, motion picture film orders, and requisitions for transportation needed for study trips. Restrictions on class activities imposed by time restraints, distances, space limitations and any special characteristics of the class will be blended into the final strategies. You and the instructional developer will meet frequently during the strategy outlining process so that the end product accurately reflects the merging of you, your class, the strategies and the classroom."

Yes, you would like to use closed-circuit television too, but in your situation you are lucky to have the lathe. Furthermore, you are not going to get even one more lathe let alone TV. Reality comes crashing down and you realize the strategy you might like to use is just not possible.

But you CAN make the picture/verbal series, you can demonstrate, and you will have to try to get everyone around so they can see and hear. If more than one demonstration is required to accomplish this, before you can start this unit, you must also plan what the children not watching the first demonstration will be doing during this time. The reality of dollar, time, space, and equipment limitation inevitably will structure your teaching and influence the strategies actually available to you.

Various media, obviously, are excluded by the realities mentioned above, but other characteristics of each medium need to be known before one can determine what medium or combination of media are to be included in the plans. Some characteristics of media that affect utilization are included on chart 7-1.

Chart 7-1
SUMMARY OF SOME CHARACTERISTICS OF MEDIA THAT AFFECT UTILIZATION

| MEDIUM | AVAILABILITY OF SOFTWARE | | TEACHER CONTROL OF PACING DURING UTILIZATION | | TYPE OF ACCESS | |
|---|---|---|---|---|---|---|
| | HI | LO | HI | LO | RANDOM | SERIAL |
| BOARDS: | | | | | | |
| Chalk | x | | x | | x | |
| Bulletin | x | | | x | x | |
| Electric | x | | | x | x | |
| Felt/Flannel | x | | x | | x | |
| Hook & Loop | x | | x | | x | |
| Magnetic | x | | x | | x | |
| BOOKS: | | | | | | |
| Paperback | x | | | x | x | |
| Hardcover | | x | | x | x | |
| FILMSTRIPS: | | | | | | |
| Silent | x | | x | | | x |
| Sound | x | | | x | | x |
| MAGAZINES | x | | | x | x | |
| MOTION PICTURES: | | | | | | |
| 8mm | x | | | x | | x |
| 16mm | | x | | x | | x |
| OPAQUE PROJECTORS | x | | x | | x | |
| OVERHEAD PROJECTORS | x | | x | | x | |
| RADIO | | x | | x | | x |
| RECORDINGS: | | | | | | |
| Disc | x | | | x | x | |
| Tape (Pre-Rec.) | x | | | x | | x |
| Tape (During Rec.) | x | | x | | | x |
| STUDY (FIELD) TRIP | x | x | x | x | x | x |
| TELEVISION: | | | | | | |
| Broadcast | | x | | x | | x |
| VTR (Pre-Rec.) | x | | | x | | x |
| VTR (During Rec.) | x | | x | | | x |
| 2 X 2 SLIDES: 35mm, Instamatic, Super, & ½ Frame | | | | | | |
| Silent | x | | x | | x | |
| Sound | x | | | x | | x |
| COMPUTERS | | x | | x | x | x |

Availability of software is largely, though not exclusively, a function of cost, and so the difference between HI and LO is somewhat a matter of opinion. The chart simply is an attempt to discriminate between those items in which the cost is (or is not) low enough so the teacher is likely to convince the administrators to purchase the material (or to purchase it him/herself). Note that we refer only to the software involved, not the equipment (hardware) necessary to use the material. In some cases, other factors than cost cause the availability to drop to LO. For example, while radio is certainly low cost (after you pay for the hardware) we would categorize it as low anyway as nearly all radio programming is scheduled by someone other than the classroom teacher, and therefore, it is unlikely a particular program will be available when the teacher may wish to use it. A similar problem exists for broadcast TV.

The control of pace exercised by the teacher is vital if s/he is to match the pace of concept development with the abilities of the pupils in the class. When the teacher is presenting the concepts and s/he is the sound source, usually s/he can control the pace quite adequately. However, some materials such as books are paced by the reader; the teacher merely starts or stops the procedure. When pre-recorded sound is part of the medium, the sound source pretty well controls the pace. Usually teachers simply let it run until the end of the material, although there is no reason one cannot stop a sound source, discuss facts, and restart the sound; thus, giving some measure of pacing control.

Access seems difficult for some people to apply to various media. A medium is said to have random access when the user can go directly to any element in the communication without having to allow the hardware to transport his/her thoughts through much extraneous material before locating the exact item desired. Serial access (also referred to as sequential access) refers to those media which force the user to proceed through the various elements in the communication in order, either while paying attention to the thoughts, or while merely transporting the software until the desired point is reached. The best examples of these two modes of access are the disc recording and the tape recording. The user can set the tone arm needle down at any point on the groove of the recording and so be at the exact information desired. Thus s/he could randomly get access to any information contained in the recording. On the other hand the same information could be recorded on a tape. Now the user must run the tape forward or backward until the desired information is found and each different location requires a search. The disc recording is thus seen as a random access medium while the tape is a serial (sequential) access medium.

It should be obvious that the availability of a medium has direct bearing on whether to include it in the strategy being considered, but what about the other two characteristics? If the teacher knows that the concepts are very complex and the learners need time to think them through, then media which offer HI control of pacing may be desired. If, on the other hand, the learner can be turned loose with the medium, perhaps LO control is more desirable. Similarly, if the facts must be learned in some particular order, serial access may be preferred, but if frequent review is needed, or if the learner will be benefited by being able to skip around, then random access media are to be preferred.

A couple of concluding statements must be made regarding certain media, for example the study trip. It can be highly available if you consider a nature study trip for first graders in which the children are walked around the school yard to see trees, leaves, flowers, etc. It would be LO, however, if you consider a study trip to another city to study, say for example, the state legislature in session. The study trip would permit a HI control of pacing if the teacher is the sole guide, such as on the aforementioned nature walk, while it would be LO if a guide simply walks you through the capitol building on a definite schedule. Access is best explained by the example of a study trip to an art museum. If the children are delivered to the door and told "meet me here in 1½ hours, they can randomly search out what interests them, while if the exhibition is so designed that the guide leads the group through in a definite pathway, it would be serial access.

Having dreamed, determined which dreams may be feasible, and which of these may be best for the communication situation at hand, (proper use of a wood gouge on a lathe) you now set down your actual plan. For these children (with their communication abilities) in this classroom (with the restrictions it and the school may impose), you (with your communication skills) will identify what is the best strategy to move the learners from the already described entry behavior to the desired terminal behavior. You must prepare the visual/verbal display. Also, you must plan activities for those who are not to be included in the first demonstration group. This may necessitate planning a complementary activity such as searching the library for project plans and drawing up actual plans for a final project. You must plan which steps of lathe work must be conceptualized by each pupil before s/he can be "turned loose" with the tools. You will also determine which more advanced procedures can be left for later presentation. Finally, you (perhaps in consultation with other experts) arrive at a workable strategy to implement this unit of work.

# CHAPTER 8
# SELECTION

> "The completed strategy outline is now delivered to the media specialists, curriculum planners and others who are needed to purchase or produce the materials and arrangements necessary to assemble the instructional package. The final selection of these individuals follows the same pattern as the selection of the instructional developer. These paraprofessionals talk with their suppliers and peruse catalogs to find the materials to turn the outline into the reality of an instructional package. For example, the outline calls for a motion picture film at a certain point in the teaching presentation. Perhaps even the film style and acting format is determined in the outline. You and the film expert select the final film from the films currently available. If the available films do not meet your expectations, you may need to design your own and have one made to order. These buy or produce decisions are made for all elements in the outline."

In the previous chapters we have described the process of determining just who it is we intend to communicate with as well as what the subject matter of the communication is to be. We have described the end product of the communication as something a student is to do. Based on these two elements, we dreamed about the ideal way to communicate the subject and then subjected this ideal to the realities of life. We are now at the point where all these abstract ideas and statements are translated into the hard facts of real media, real lesson plans, and real children.

There are only three ways of acquiring media for use in the teaching/learning situation. You can buy or rent a finished product from a supplier, you can buy the talents of people who will make a product to your order, or you can make your own.

As a general statement, we would suggest that whenever possible you purchase finished media from school suppliers. Our experience would indicate that this is the quickest and easiest way to end up with a professional looking product; after all, the production of good usable media is the only purpose for which such suppliers remain in business.

Whenever you purchase or rent media, you are involved in the selection process. To make a valid selection, you will need to search for any and all items that may have a bearing on the subject under consideration. Your local resource people can include your librarian, audiovisual specialist, media director, curriculum specialist, subject matter specialist or media salesperson. They should be given copies of your audience analysis and behavioral objectives as well as the agreed upon teaching strategies. From their files they will supply you with titles, catalog descriptions and reviews of materials. Depending upon the number of titles which seem to "fit," you will want to cull the ones that sound most promising and bring them to your location for preview. Sometimes you can preview the very newest materials at professional meetings where suppliers have an exhibit.

Most school districts and media suppliers will have policies regarding the preview of materials. It is most important that these "house rules" be followed. In many cases the media or subject matter specialist will be in a position to secure preview copies for you. Try and schedule these materials as close together as possible so that your memory of each will be fresh. Also select a time in the school year when you can view the material in a leisurely manner. Certainly, the week grades are due is NOT a good time to have six filmstrips and four 16mm films in for a three-day preview.

Once the material is in hand, set up a reviewing time for yourself. As you view the medium for the first time, you will want to check the subject matter and overall emotional response to the medium. If it passes this test, you will want to view it a second time, paying close attention to the following:

1. Clothing and hair styles of the characters. Old-fashioned items do not mean you reject the medium out of hand, but it does suggest a more careful review of the other aspects of the material.

2. Age of the characters. They should be within one grade or age level of the described audience.

3. Vocabulary. Your audience analysis should have provided a measure of their ability to read and write. The material should fall within the vocabulary range of the audience.

4. Racial, ethnic or sexist traits. Current materials seem to have recognized these sensitive areas and tend to be neutral in this regard. However, watch for inappropriateness in these factors in older materials.

5. Socioeconomic areas. Are the people shown in the medium ones that your target audience can relate to? A northern inner-city setting may be inappropriate to a western rural class, just as a suburban setting may be unacceptable to the inner-city class.

6. Automobiles. Most children are sensitive to the age of automobiles and a 1968 automobile can "date" a medium just as fast as hair and clothing.

7. Small changes in society. The authors can remember the large number of seemingly unrelated films, filmstrips and tape recordings that became dated after a man stepped on the moon, because the medium contained a casual, but now false, statement about the moon and our relationship to that heavenly body.

There are many other factors which can cause a medium to be rejected. These should be based on the careful analysis of the audience, not personal whim. It should also be clear that one or even several inaccurate statements do not mandate the rejection of an item. There are

several ways discussed in Chapter 10 which describe how to work around small errors.

After you have seen the medium several times, and if you still think it might be of some value in the unit of work, you will want to have additional opinions. You might ask the media specialist to view it and comment on the technical aspects of the production. You might ask the subject specialist to comment on the correctness of the data as well as any flaws of logic, design or information. You should select a few members of the target audience to view the material and get their reaction to the medium. We remember the students' response to the first films on drug abuse which were highly acclaimed by parents and teachers as showing the "true" story of the "dope" scene. These were laughed at by the target audience because they know what the drugs did and it bore little or no resemblence to the things shown on the screen. It was a case of adults putting on film their fears and prejudices, not the facts as they were.

Once you begin to preview material, information will tend to blend in your mind and you will have a hard time differentiating which title had particularly strong or weak points. Therefore, we suggest that you use the media evaluation form printed below, any of the many media evaluation forms commercially available, or an evaluation form of your own design. In any case, all people that preview a medium should fill out the same form. Points or values can be assigned to each title by each evaluator. These completed forms should be filed for reference.

INSTRUCTIONS FOR COMPLETING THE MEDIA EVALUATION FORM

1. What type of medium is this? 16mm film, filmstrip, kit tape recording, TV program, etc.

2. Title of the medium.

3. Give some measure of how long it may take to use the medium: for a film, a tape recording or a record, the number of minutes; for a filmstrip or a slide set, the number of frames; for a book, the number of pages; for a game, the estimated playing time; etc.

4. The evaluator's name.

5. Check the appropriate box.

6. Check the appropriate box.

7. Copyright date or date of production.

8. Give possible use(s) ("How Doughnuts Are Made in Davenport, Iowa" might be used in <u>home economics</u> and in <u>math</u>).

9. Source is where you would go to purchase or rent the medium.

10. Author is the person responsible for the intellectual content.

11. Use the latest prices available to you.

12. The synopsis is your summary. This is to be a factual account of what the medium presented. A reader should have a good idea of the content of the medium after reading this item. DO NOT use subjective words. These are used in item no. 20.

13-18. Circle the appropriate number. NA=Not Applicable. 0=Of No Value. 10=Perfect.

19. Check as many categories as are appropriate.

20. This is the place to praise or condemn.

MEDIA EVALUATION FORM

1. Type of medium_____ 2. Title_____

3. Length_____ 4. Evaluator_____

5. Silent ☐ 6. B & W ☐ 7. Date Produced_____ (Copyright)

Sound ☐ Color ☐

8. Possible use in what subjects? A._____ B._____

9. Address of producer or rental source

_____

_____

10. Author_____

11. Purchase/Rental $_____

12. Synopsis (Do not use evaluative words):

13. Rate the picture quality as to clarity, color, sharpness, etc.

NA 0 1 2 3 4 5 6 7 8 9 10

14. Rate the sound quality as to audibility, voice fidelity, music, etc.

NA 0 1 2 3 4 5 6 7 8 9 10

15. Rate the structure as to organization, editing, continuity, etc.

0 1 2 3 4 5 6 7 8 9 10

16. How well does this medium fit your audience?

0 1 2 3 4 5 6 7 8 9 10

17. How well does this medium fit your objective?

0 1 2 3 4 5 6 7 8 9 10

18. Your estimate of the overall value of the medium?

0 1 2 3 4 5 6 7 8 9 10

19. What grade level(s) could profit by use of this medium?

Primary_____ Intermediate_____ Jr. High_____

Sr. High_____ College _____ Adult _____

20. Your comments:

After a reasonable time for previews, a final selection will need to be made. The titles can be ranked in order of their value on the evaluation form. They can be grouped by preference of the several groups that previewed the material. For instance, a negative evaluation by students may carry more weight than the same negative evaluation by a teacher. The final selection should be made after a careful review of the audience and the purpose statements. Other factors to consider might include the cost of the item relative to the total budget or the importance of the title to the total program.

The actual purchase or rental of the material should now follow the local purchasing procedures. Again, we would stress the need to carefully follow all local policies. It is also a worthwhile expenditure of your time to follow the process to completion so that the order does not become "lost" on the desk of some clerk or administrator.

In some cases the search of the selection tools will not bring in a title which is acceptable. Several options are now open to you and the instructional developer. You can return to the dream and reality statements and select another teaching strategy, preferably from an unused level on Dale's Cone of Experience. You might go back and write a new behavioral objective and then review the evaluation forms for materials that are acceptable to the new objective. Or you might produce your own title.

If you think your topic has a very broad appeal and that the end product might have a sales potential, you might convince a regular producer of media to produce and sell the item. This is, of course, a very chancy proposal but it is an option.

If your budget is large you could buy the talents of photographers, artists, recorders, painters, script writers, cinematographers, television studios, etc., and produce your own title. Again, this would be most unlikely to happen but it is an option.

The most likely way that you will be able to produce your own title would be with the help of your local media specialist, your talented friends and your own abilities. (See also, "Plunge Into the Fun World of Local Production: Media Production For the Classroom Teacher" (available from the Illinois Office of Education) or any of the books on local production available from book publishers.

It is important that you keep an objective view when you produce your own material. We all have a very natural tendency to become emotionally involved with anything that takes as much time and effort as a good local production. We suggest that the finished product be subjected to the same review as the commercial material and that it only be used if it meets reasonable standards of professional quality.

# CHAPTER 9
# THE TRIAL RUN

> "Theoretically at this point, the experts will purchase or produce the materials selected and will assemble the instructional package described in the strategy outline. Also, in theory, the teacher needs only to wait for the completion date as set by the experts. In reality, materials (even from the latest catalogs) are not always available when needed due to shipping problems, clerical errors, and general human actions. Therefore, the teacher and the instructional developer must maintain close and regular contact with the experts so that alternative materials can be selected which will maintain the integrity of the strategy outline. In addition to materials, the paraprofessionals and workers making materials will make modifications in the outline based on their technical knowledge and whim. Therefore, the teacher and the instructional developer must regularly inspect the materials and accept or reject the production serendipities."

The activities described in Chapter 8 are repeated for each of the various strategies decided upon in Chapter 7. After some period of time (usually several months) you will have in your possession a variety of teaching materials for use in the unit. These materials might include a 16mm film, several filmstrips, a chapter from a book or a government pamphlet, some models and the raw material for a bulletin board.

Frequently, the sum of these educational parts is greater than the individual item.

At this point you will need to examine all of the materials at one time. This will permit you to check for commonality of language and to determine the best order for the various items. You will need to write a script, i.e., detailed lesson plan, to tie the various elements together. At this point you may wish to consult a curriculum specialist or a person schooled in learning patterns of children.

Select a small group of children from the target audience and try out the unit of work. Your selection of children should be representative of your total audience. Do not make the mistake of selecting the brightest or most cooperative children. They will tend to learn no matter what you do to them or even how you do it.

After the tryout, test the group. This can be done through objective means such as true/false or multiple choice questions, through a performance of some skill or through the more subjective means of essay exams and personal interview. The purpose of this exam is to verify the effectiveness of the learning package, not to assign a grade to the youngster. As you evaluate the results, you will want to keep in mind the Hawthorne effect that any experiment will have on a group. You will remember that in this series of experiments, the researchers found that change alone caused a positive response on the part of workers. It did not matter what was changed in the work environment, as long as there was change.

To help you interpret these test results, you may want to consult a tests and measurements specialist. It would be best to have this specialist advise in the construction of the test as well as the final interpretation of the results.

Your interpretation of the test results must NOT only be in terms of the learner and the factual knowledge gained but also be concerned with how the student liked the material, the method, and the subject. Your interpretation of the results must also look at the media used and the teaching style used.

If all of your work up to now has been done perfectly, you can now add the package to your class and concentrate on some other topic.

Realistically, this first tryout will produce some weaknesses that were not visible in the instructional development plan. The unit must then be revised based on the interpretation of the test data.

The revision may be as simple as changing the instructions for a unit of work, the expansion of the vocabulary section or the changing of the pace or speed of the presentation.

It may become more complex and involve the rearranging of the various elements in the unit. It might involve the addition of a whole new item into the unit or the replacement or subtraction of an already acquired item.

One last possibility exists and that is for the whole unit to be abandoned as unworkable. If you have followed all of the steps described above, this level of revision should not happen because the whole process of instructional development is designed to minimize the gross errors of curriculum design.

In any case, a new subgroup of the target audience is selected and the revised unit of work is tried out. The students are tested and, again, the unit is revised if it is found faulty.

This tryout, test, and revision process goes on until the unit does the task it was designed to do and the students are meeting the objectives written at the very start of the instructional development process.

The unit is now ready to be "mainstreamed" into the regular curriculum.

## CHAPTER 10
## UTILIZATION

> "The dream of the past has become the reality of the present and you are ready to try out your new instructional package. Assuming the adequacy of the instructionally developed strategy outline and the quality of the various experts' execution of this outline, your tryout of this new instructional mode rapidly converts this sterile package into a comfortable successful teaching/learning situation. Conversely, if the instructional developer and/or paraprofessionals inadequately interpreted you and your class, the instructional package may only become a comfortable teaching/learning situation after modification."

In this chapter we would like to answer the question "Now that I have it, what do I do with it?" or the utilization of media. We have defined media in a very broad way, i.e., any material used in the teaching/learning communication situation other than the textbook or conventional lecture. (Of course the utilization of these communication methods would benefit from the ID process, but we consider these to be special cases.)

There are many ways that we acquire our educational media. The best, in our opinion, is through the instructional development process described above. Realistically, however, we know and understand that this is not the normal way materials are incorporated into the teaching of a unit. With luck, another teacher has used the ID process and developed a unit of work that you think you can use. Maybe you each worked on a unit and are trading. Maybe it's the only media in the school district and to the children it's better than nothing. Maybe it's a mandate from the central administration that a certain film be shown in all classes of a particular subject or grade level. In whatever manner it was determined that an item of media should be shown or used in a classroom, the six step approach to media utilization can help your students get the most out of the educational time. The six steps are:

1. Prepare yourself
2. Prepare the environment
3. Prepare the student
4. Use the medium
5. Review
6. Test

1. Prepare Yourself. The best place to begin the process is a full scale review of your audience analysis and your behavioral objectives. Then as you preview the material to be used you can recheck for its fit with where your class is now. You should look for links and ties to past material so you can prepare them for the information. You should make lists of new words and items for the students. You will need to preview related material to determine where in the unit the media is to be used and best sequence of activities.

If the material is a model or some other working item, you should practice with it until you are no longer curious about, or in any way unfamiliar with, the item.

When you have previewed all of the items to be used, you should write your lesson plan for the unit of work. A unit is defined as any complete concept or idea taking from one class hour to three or four class weeks.

2. Prepare the Environment. Assuming you accept the role of a teacher as being the director of learning, then you are the one who is responsible for all those environmental factors which have a bearing on learning. It is your task to check on each child's learning environment.

Every teaching/learning station will have two different types of problems - those that you can control and those that you cannot. Your difficulty frequently is in being able to differentiate between the two. We suggest you accept those things which cannot be changed, i.e., the marching band outside your classroom during warm fall days, with as much grace as possible since students have enough problems learning when the world is in harmony, without the added problems of an angry or frustrated teacher.

Factors which should be checked and corrected whenever possible include:

Temperature: Windows and doors should be opened or closed as needed. Air-conditioning and/or added heat sources should be activated when available. Don't forget the temperature difference caused by a full sun streaming through the windows and the cooler other side of the room. Draw drapes or move the students away from these hot spots and/or drafty places.

Noise: Noise outside of a classroom is one of the hardest items for a teacher to control. In most cases the closing of doors and windows is the best solution. If your teaching subject requires general quiet and you are next to the shop, gym or lunch room, you may need to request a room change.

Odors: Cafeteria odors just before lunch can be a major distraction. The best solution is to close the windows and then ignore the odor. This should minimize the distraction to the children. If you openly carry on about the problem, it will seem bigger to the children than it really is.

Ventilation: Fresh air is vital to student alertness. Become conscious of stale air which can lower your efficiency and that of your learners.

Light: In the ideal school room the lights will be set in two or more banks with a separate control for each bank. Rheostats are important for adequate light control.

Watch for glare on the chalkboard surface. This problem can be corrected by drawing one or more drapes to reduce the direct light on the board surface.

Ambient light is defined as unwanted light falling on a projection screen surface. Ambient light washes out the image and prevents effective viewing of the projected material. The two most common causes of ambient light are sunlight through windows and interior hall lights shining through doors or glass walls. Covering the offending windows is the best solution. You may need to reposition the projection screen if the windows cannot be adequately covered.

While ambient light might be called a case of too much light, the other side of the coin is insufficient light. This is particularly true when students try to take notes during the use of media. The rheostat mentioned above is one way to remove the ambient light while keeping a low level of light in the room. Keeping one bank of lights on while using media is another.

A totally dark room can pose a real threat to the safety of children. It should be a firm rule that no one is to move around the room when the lights are off. The safest light control set-up permits the teacher to turn the room lights on/off with a switch located in the rear of the room near the projector. The safety switch is rarely present in classrooms, which means a student will have to go to the light switch, usually by the door, and then return to his/her seat in the dark. Be certain the child has a clear path to and from the light switch. You will, of course, be certain that the student can see the screen when returning to his/her seat.

Safety: As the teacher you have the responsibility for the safety and security of your class. Extension power and speaker cords can be a real danger to the children as well as the equipment. Well designed rooms minimize the need for extension cords, but any time you have the cords lying about the room, you have potential danger. The first rule should be no movement of children when the room is dark. Secondly, children should be taught to walk cautiously around the equipment whenever it appears in the room. (We know how hard this is but in the event of legal action, you will at least have the protection of having issued the warning.)

Equipment should be used while on a stable cart. Placing the projector on a student desk is inviting damage to the equipment. The equipment power cord should be plugged into the cart and the cart power cord into the wall or floor receptacle. If the cart cord is kicked the equipment will have less chance of falling to the ground. In the event you must plug the equipment cord directly into the outlet, tie the cord to a chair or table close to the projector and then plug into the receptacle. Again, this will minimize the danger to the equipment.

Use only as much cord as is needed to reach the outlet. Excess length increases the danger of student injury since curls and loops can easily "catch" a child's foot. Fold up extra cord, secure with a string or rubber band, and place under the machine support. Run the cord to the nearest outlet and choose a path with as little student traffic as possible. If the equipment is to remain set up for several class periods or days, the cord should be covered with duct or masking tape to keep it flat to the floor. The best protection is specially designed rubber mats which can be placed over the cord to prevent tripping.

Other things to watch for include wet spots on the floor which can be slippery and cause a fall. Watch for sharp edges on tools, audiovisual equipment, displays, etc. Check the safety cover on moving parts on models, mock-ups and realia. And, of course, exercise great care in the demonstration of materials which can break or spill any liquid.

Along this same line you should know the emergency fire, tornado and other disaster drill procedures for each teaching location. You will need to lead the group to safety and make the decision. Know at least two ways out of the building where you are teaching.

Forewarned is clearly forarmed.

Screen Placement and Selection. In most modern school rooms a permanent wall mounted screen has been provided. In these cases, the teacher's responsibility is to provide each learner with a clear, unobstructed view of the projected image.

The lowest point of the projected image should be level with or above the top of the heads of the seated students. Any lower and the shadows of student heads will prove a major distraction.

When projecting an image on a screen, the entire screen surface should be filled. Assuming the above, no student should sit closer than two screen widths nor more than six screen widths from the screen. Any closer and the student cannot see the entire screen at one time and therefore might miss some important action. Any further away and detail becomes too small to see. To test this concept, we suggest you experiment with your home television set and a baseball game. Try and watch the action close up, then try to see the ball while seated far across the room.

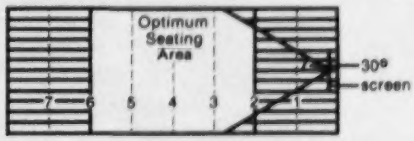



Figure 10-1. Optimum seating for viewing a projected image

In addition, best viewing is from inside an arc 30° on each side of the axis of projection (See Figure 10-1). Watch for ambient light as described earlier in this chapter.

Keystoning is a major problem when using the overhead projector. It can also be a problem with any projected image. Keystoning is defined as an image in which one part is larger than another. Its most usual shape looks like Figure 10-2. You will note that the top of the image is larger than the bottom of the image. This distorted image is caused when the projector and the screen are not centered with each other. Note Figure 10-3.

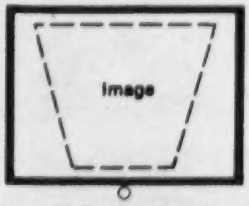



Figure 10-2. Keystone image

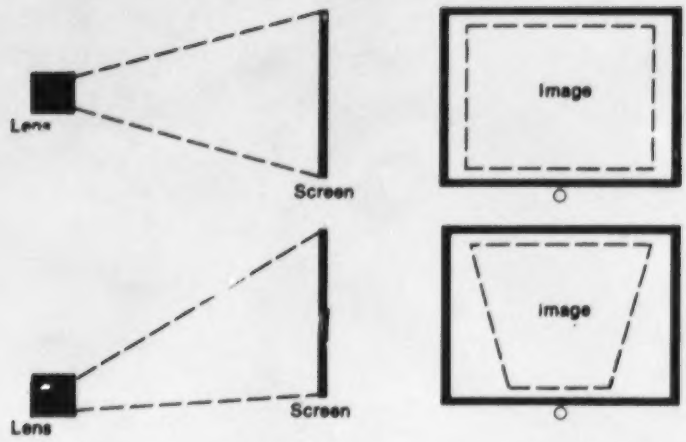



Figure 10-3. Lens/screen positions

When the top of a keystone image is in sharp focus, the lower portion will be out of focus. Likewise, when the lower portion is in focus, the top will be out of focus. When you focus on the center of the image, both the top and bottom of the projected image will be out of focus. Clearly (pun intended) then, when a projected image has a keystone shape, it must be changed to a non-keystone shape.

There are two ways to correct the keystone problem. One way is to bring the projector head up to the center of the screen. This works well with 16mm motion picture, filmstrip, and 2 x 2 slide projectors. It is a problem, however, with the overhead projector since the projector is in the front of the room and placing the lens in the center of the screen blocks the view for many of the audience.

The second way to correct the problem is to tilt the screen so that it is perpendicular to the lens. See Figure 10-4.

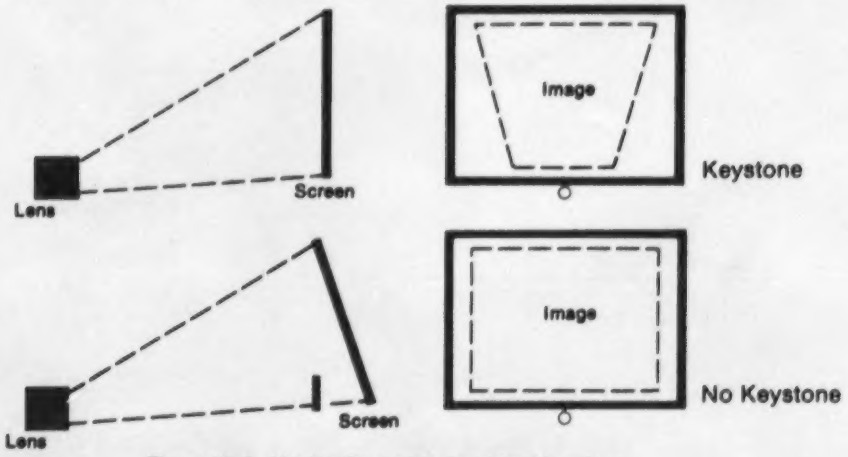



Figure 10-4. Moving the screen to correct keystone

Either the top of the screen can be tilted forward or the bottom of the screen can be pulled back. Wall mounted screens should be hung at least 12 inches from the wall so that they can be pulled back to correct for keystone. Tripod screens can be purchased with a top part to permit movement of the screen. See Figure 10-5.

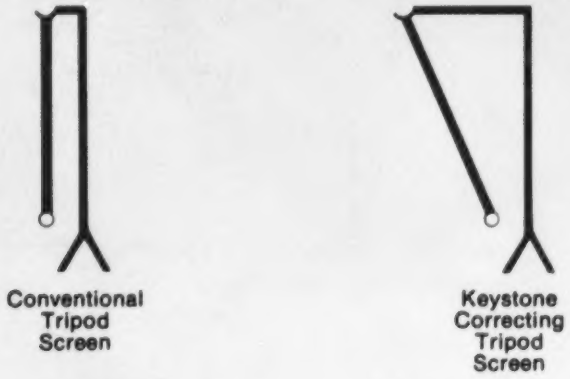



Figure 10-5. Tripod screens

So far we have assumed that you are working in a room which has a screen as a permanent room fixture. There will be times, however, when you will need to select a screen for your room. The easiest way to determine the size of the screen is to measure the length of the room and divide by six. This will give the proper sized screen which will maximize the seating area for the room described above.

The most usual placement of a screen is in the front and center of a room. See Figure 10-6.

Figure 10-6. Screen placed front and center in a room

Sometimes there are compelling reasons, such as strong ambient light, for moving a screen to another location. In all cases the screen should be in the front of the room but either corner can be chosen and still provide a good view for all of the students. See Figure 10-7. The screen should be placed against the source of the ambient light. For instance, if windows were in the top wall of Figure 10-7, you would use the screen in the Number 1 position.

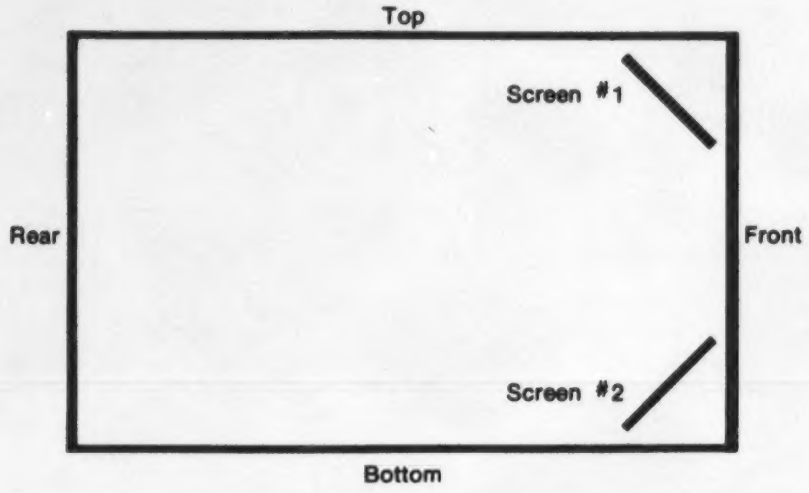



Figure 10-7. Screens placed front and corners in a room

In addition to choosing between a wall mounted or tripod screen, you can pick among a matte white, beaded, lenticular, or rear projection screen, depending on the light conditions of the room.

The matte white screen is the least expensive screen and must be used in fairly dark rooms. It is a good choice in most rooms.

The beaded screen is essentially a matte white screen with glass beads glued onto the projection surface. It is somewhat more expensive than the matte white screen, but has a brighter image. This is useful in larger rooms that can be kept very dark. This screen is particularly sensitive to ambient light and has a somewhat softer focus than the matte white screen.

The lenticular screen was designed for the modern classroom with many large windows and an abundance of ambient light. It was constructed in such a way that ambient light is directed away from the eyes of the viewer, making the image stronger and more easily seen. Since it is considerably more expensive than the matte white screen, it should only be used in the very hard-to-darken rooms.

The above three screens are generic and are available from a variety of manufacturers. One manufacturer's specific screen must be mentioned, however, since it can be used in full sun or any brightly lighted room. The Kodak Ektalite screen is a specialized form of the lenticular screen. It is so good at fighting the problems of ambient light that when it is used in a fully darkened room, the image is so bright as to hurt the eyes.

Another answer to the problem of ambient light in the classroom is the rear projection screen. These screens operate on the same principal as the television picture tube and, with a small amount of shading, can be used in a fully lighted room. Room size limitations have made this method of projection impractical for full class viewing. It is most widely used in study carrels or other individual or small group viewing situations.

Selection of the screen, then, depends on the light level of the room, the size of the room and the number of viewers.

Conclusion. We have seen that the most common classroom environment problems include temperature, noise, odors, ventilation, light, safety and screens. In the ideal world, each of these will have a solution and you will utilize the media in a perfect environment.

In reality, we know that problems frequently do not have a solution, e.g., the marching band outside on a warm fall afternoon. Or else, when we attempt to solve one problem, we create another. For instance, the outside noise can be controlled by closing the windows, but then the room becomes hot and stuffy and there might even be a problem of odor. What do you choose - noise or heat and odor? There is, of course, no one solution. You, as a professional teacher, will need to assess your audience and make a decision based on the group at that moment in time. Today's solution might be tomorrow's problem.

3. Prepare the Audience: The teacher's first step in getting the audience ready for a medium can be illustrated by the story of the Missouri farmer who had purchased a new mule. It had been guaranteed by the mule skinner to be one of the smartest and most cooperative mules in the country and would respond to voice commands of "go," "right," "left," "plow," "pull," "stop," etc.

The next day the farmer hitched up the mule to the plow and said, "plow." Nothing. So he said "plow" again. Again nothing. This went on for a while until the farmer yelled "stop it," and, of course, the mule did that. By this time the farmer was more than a little upset. He removed the plow and dragged the mule back to Friendly Sam, the mule man. (You can just see the furrows behind the mule as the farmer drags the stiff-legged mule to Friendly Sam.)

"What's up," says Friendly Sam with a smile, hands in his overalls, and a chew in his cheeks.

"You *#%---?!!! That mule is so dumb, so stupid, that he didn't do a thing you said he would. I hitched him up, and asked him to "plow" and not a thing. I want my money back."

"Well, now, I still say this mule is what I sold him as! Watch!" Friendly Sam picked up a 2" X 4" and wacked the mule right between the eyes.

The farmer complained. "What did you do that for? You said he would be cooperative and work with voice commands only. Why, using the 2 x 4 makes you and the mule no better than any other mule skinner. Give me my money back."

"No way. This mule is, indeed, cooperative and works with voice commands. It's just that first, you have to get his attention."

So, too, your first task in the classroom is to get the attention of the students. You will not, we hope, have to hit your students between the eyes with a 2" x 4" (or its verbal equivalent) but you will have to use some attention-getting devices. Depending on your audience and classroom, you will need to choose something that permits the student to shift gears from his or her personal fantasy world to your classroom and subject. If you are teaching classes where the students are highly motivated and mature, you can get their attention by simply saying something like, "OK, let's get started." In a driver education class, you can get their attention with, "Today's lesson might save your life some day." Unfortunately, most of us teach classes that do not have a high proportion of self-motivated students or a subject with life and death decisions hanging on knowing the course content.

Several techniques or signals which appear to work effectively include:

1. Briefly turning the lights off and on in a windowless classroom.
2. A bell on the teacher's desk.
3. Tapping the desk with a pencil.
4. A standard phrase such as "listen up," "can I have your attention, please," "quiet," etc.

Once you have their attention, you will need to lead them into the medium. You will need to prepare their minds for the message the medium will bring. It is not enough to say, "Let's see the movie." (The authors wish to put in an editorial aside about the use of the term "movie" to describe a film in the classroom. Since meaning is in the person and most people associate a "movie" with entertainment, the use of the term "movie" in the classroom prepares them to be entertained. We assume that your purpose for using a film in the classroom is that it is the best way to deliver some content to the class, not just to entertain them. Therefore, we recommend the use of the term "educational film" or "film" in your introduction, rather than movie. We hasten to add that we see nothing wrong with entertaining a class, especially when used as a motivational tool.)

One of the ways to prepare a class for the use of media is to tie it to past learning and experience. Show the class how it will extend their knowledge of the subject under discussion.

Tell the class what to look for in the medium. This is not a Hollywood "who done it" where you do not want to spoil the story for the viewer. The student will need to know the purpose of the medium and which parts are important. Most media have much more information than the student can possibly remember, so guidance toward the relevant points is important.

We are reminded of the story of the new assistant preacher who lost the congregation sermon after sermon. He noticed that his superior always had warmly received sermons and that people remembered the message (for a few days anyway). So he asked the older man the secret of his preaching. The older man said, "First I tell them what I'm going to tell them, then I tell them, then I tell them what I told them?? So too in the use of media, you first have to tell them what the media is going to tell them.

You will need to counter false statements that the medium might contain. These should have been noted when the film was previewed (see Chapter 9). You will need to mention some dated aspect of the medium so that the class is not so "hung up" on the funny clothes, old cars, or strange hair styles that they miss the educational message of the medium.

It is important to define words and terms that are new to the class. The authors use a film in their teaching that contains the phrase, "The admiral has retired and is turning the fleet over to you for sinking." We both thought that the admiral had been so upset with a crew's performance that he had taken his pension and quit the Navy. (The content did not fit the thought that he had gone to bed, which, however, is another, logical interpretation to the phrase.) After some years of using the film we had a student who had spent a number of years in the Navy and he explained to us that in the Navy, after a Naval engagement, the losing fleet would go into a full scale pell-mell retreat, i.e., retire from the scene of battle. This, of course, changed the meaning of the statement and made the film even better.

Another method of getting the class ready for the use of a medium is to have the class prepare a list of questions that they think the film can answer. Or you can give the class a set of questions and tell them to look for the answers in the medium.

A word or two of caution; remember that your class is anxious to see the medium. Don't dull their anticipation by dragging out your introduction. Be brief and to the point. If you take 20 minutes to introduce a 10 minute medium, why bother using the material at all? Be careful also that you don't overdo the questions and "things-to-look-for." Many media have a certain aesthetic value of their own and should be enjoyed as an experience, not just as a group of individual answers to teacher-posed questions.

4. Use the Medium: So far you have looked at the visual material, you listened to the audio, you took the study trip, you got the learning environment in top condition and have the audience all set and eager to learn from the medium. You now need to use the medium in the best possible manner. It would be a shame to do all of the above and then

lose the audience by failing to observe the following simple steps in effective presentations.

The medium should be set up and cued to the exact start of the material. When you have your audience ready, you can move quickly and directly to the material without giving the group a chance to be distracted.

If you are using projected material, do not start or end with a white screen. This encourages students to put their hands into the light beam. The audience, then, is distracted from the main purpose of the material and your careful attention to getting them ready for the medium is lost. When using a 16mm film, do not run the 10-9-8-7---. This is worse than the white screen, especially when the class starts the count down chant. If you cannot cue the film before the class period, a card held in front of the lens will prevent the white screen and the numbers from being seen and yet permit you to start with the title. When using 2 x 2 projectors, solid cards at the start and end of the presentation will prevent the white screen. Filmstrips can use the card as mentioned above. The overhead projectors should not be turned on until the transparencies are on the projector stage and, likewise, it should be turned off before removing the material from the stage.

Focus is another important aspect to proper viewing. When materials are out of focus, even a little, it adds "noise" to the system and interferes with the message. The correct way to focus material is to go from soft focus, to sharp focus and continue into soft focus. Then return to sharp focus. It may take several passes till you are certain that you have the best possible focus. You cannot ever be certain that you have the best possible focus if you only go from soft focus to what you think is sharp.

Audio material should be started with the volume low and then brought up to the appropriate level. Whenever possible, the speaker should be slightly above the heads of the listeners. When speakers are placed low, the sound is absorbed by the bodies and a higher volume is needed for all to hear. When the material is finished, you should turn down the volume so that the sound fades away. Avoid the hiss, crackle and pop of static. This noise also will distract the students from the main purpose of the presentation.

We recommend that only that portion of a medium be used that is consistent with the audience and the objective of the unit. Because the film or tape is 15 minutes long, or there are 82 pictures in the filmstrip or slide set, is not a sufficient reason to use these items entirely. You would not require a student to read a 100 page book when the material for the unit is found in Chapter 8, pages 76-81.

You can stop the medium at any point where the content is weak, needs further explanation or has raised questions that need answers. Remember that the medium doesn't have to be run through from the beginning to end without stopping just because it was made that way. Media should be used creatively and actively and this includes using only that part of the medium which is appropriate as well as stopping the material at appropriate, pre-planned intervals.

Multimedia is another concept that has many advantages. This concept suggests that two or more different media be used at the same time or sequentially in the teaching of a single concept. For instance, a filmstrip may be used to show the animal in a great deal of detail. Then a film clip might be used to show the animal in action. This could be followed by an overhead diagram showing the parts of the animal and how they work in the action shown in the film. A model could show the same parts in 3-D while presentation of a live specimen could conclude the days work. A bulletin board could be the final wrap up of the topic.

All media are subject to Murphy's Law which states that "if it can go wrong, it will." The several corollaries include "If several things can go wrong, the one that will go wrong will cause the most damage" and "when it goes wrong it will go wrong at the worst possible moment."

The problem then is not "What if something goes wrong?" but, "What do I do when it goes wrong?" One of the most common problems is the burning out of projection lamps. When a projector is to be used, a spare bulb should be physically next to the projector. Then, when the bulb burns out, it is a simple matter of removing the bad bulb and inserting a new one. In a minute or two the projector is back in service. CAUTION: Always unplug the projector when changing bulbs. Also approach the bulb with caution since you can get a nasty burn from a hot bulb. Handled in this manner, the class will not have much time to get off of the subject and they will be impressed with your professional cool and competence. We are aware of schools where spare bulbs are one of the main occupants of the school safe. When a bulb burns out the teacher must bring the burned out bulb to the office and wait for a new one. How demeaning to have the secretary or principal peer over their glasses as if to say, "How dare you burn out my bulb." How educationally unsound to leave your classroom. How far the children will be from the subject matter. How hard it will be to get them ready again--if you can get them back on this day. All because there is a fear that the $13 bulb will be "ripped off." Ask the person responsible for this kind of bulb replacement policy to price the school's cost for the missed class time and see how the small value of the bulb stacks up.

A second problem is the breaking of the medium, particularly 16mm film film. Again the key to good utilization is to keep the show on the road and not to allow this action to put you out of business. If a 16mm film breaks, simply overlap the two ends about 2 1/2 - 3 feet on the take up reel and continue to show the film. Slip a small piece of paper at the broken point. After class, return the film to the school's media specialist and have them repair the film. DO NOT fix it yourself with tape, rubber cement, straight pins, staples, or paper clips. This only increases the amount of damage.

If you are a regular user of media, you will want to have a number of items in your emergency survival kit. These items can include an extension cord, three prong outlet converter, tape, pliers, screw driver, and flashlight. Other specialized material will depend on the equipment you normally work with but could include lens, cleaning tissue and fluid, mechanics towel, felt-tip marker, band-aids, pencil and note pad and aspirin.

Showmanship, then, means much more than getting a picture on the screen and sound out of the speaker. It means more than starting a class on time or in such a way that the medium ends with the class bell. Showmanship means being professional with your media presentation. Showmanship means putting a picture on the screen and sound out of the speaker, and smoothly keeping it there without interruption or distractions. Showmanship means the information is the center of attention, NOT you.

No one notices the media operator when everything goes as planned. But we all remember when the P.A. system didn't work; when the extension cord was pulled out of the wall socket, and the film didn't start, all after the lights had all been turned off; when the brand new projector was delivered just as the class got underway and when the film was to be shown, nobody in the class knew how to run it; and when the projection lamp blew out at the start of the slide set and the spare bulb was 15 minutes away. That's when the media operator rather than the content is the center of attention.

The true professional has made every mistake in the book once, but s/he never makes the same mistake a second time.

5. Follow-up: Since you told them in advance what you were going to tell them and then you told them, now you need to tell them what you have told them. We call this follow-up or review. There are many ways to accomplish this review and the following suggestions are only a few of the many ways available to you.

1. Use the medium again. Research has shown that there is a significant increase in the amount of learning when a medium is used a second time. Most items contain so much information that much of the pertinent material is missed the first time.

2. Use the medium without the sound or the picture. This forces the student to think through the other half of what they are seeing or hearing.

3. Use the medium without the sound and have the teacher or child tell in their own words what the action is all about.

4. Have the student or the teacher tell the content in his/her own words.

5. Have the student answer homework problems based on the medium's content.

6. Have a question and answer session.

7. Divide the class into groups and come to conclusions which are reported to the whole class.

8. Select another level of Dale's Cone of Experience and teach the same subject content with the second medium.

As you plan your review, leave lots of room for serendipity. For instance, an elementary class was shown a film on school bus safety. They got so involved with the problem that they wanted to make a program of their own. They used the school videotape recorder, wrote scripts, got permission to use one of the local school buses, practiced, shot footage, edited and produced a videotape that was used by all of the schools in the district. The values accruing from this sort of involvement went far beyond the information in the original film. An alert teacher should always be quick to capitalize on such interests stimulated by a film or other medium and guide the students into meaningful and constructive channels of communication.

6. Test: All media used in the teaching/learning process should be included in any test which covers the unit of work. We suggested early in this paper that instructional development is a team process. A tests and measurement specialist might be called in at this point and asked to help in the construction of the test which will measure how well the behavioral objectives have been learned.

When the test has been graded, you can reteach those points that were missed by a significant number of students. Or you can work with individual students on the weak points in their learning. The test may serve a gate-keeping function and only students that receive a predetermined score can move on to the next unit of work. Students below a given score may need to repeat the unit or be retaught with a different medium or teaching strategy.

## CHAPTER 11
## REVISE

> "You and your class are dynamic and changing. Your instructional package is static and unchanging. As the static package and the dynamic class diverge, the early comfortable teaching/learning feeling is replaced with an uncomfortable fit. Depending on the nature of the changes in the class, minor or major modifications will be needed to restore the instructional package to a comfortable, successful teaching/learning situation. For instance your unit on the solar system is outmoded by new discoveries resulting from space exploration. Meanwhile your class has become more sophisticated in the ways of space exploration from their own personal television viewing. Minor changes in the unit on the solar system by the substitution of a new videotape for an outmoded 16mm film converts the package from a dated concept to an exciting new experience for the class, and the comfortable teaching/ learning situation is returned. As another example your plans for a class of 18 students are met with a financial crunch in the school district resulting in 40 students in your class, including five mentally retarded children being mainstreamed. Substituting a new videotape for an old 16mm film cannot meet the needs of this expanded class as you have only one TV set and they cannot all see it at once. Furthermore, the mentally retarded children can't comprehend the totality of the package. Therefore, a major addition of one or more TV sets, plus a set of remedial materials for those that fall behind, is needed to return the class and the instructional package to a comfortable, successful teaching/learning situation. As a third example, your class suffers from the zero population growth and drops to only eight children; the space program is discontinued in favor of a greater felt need of society for solutions to the energy problems. You now have an instructional package which is beyond the interest or needs of the class. At this point no modifications will recreate the comfortable, successful teaching/learning situation and a decision is made to drop the unit from the class activities."

So you have an instructional package put together which took into account the communication model, the establishment of instructional objectives designed to move the learner from a known level of entry behavior to a desired level of terminal behavior and the selection of appropriate strategies. You have gathered together the necessary materials, facilities, plans, and equipment; you have tested the entire procedure on appropriate learners; and you have been using the package, with comfort and confidence for some time. Success has been apparent. Your students are learning. Everybody is happy--or are they? Are you becoming aware that occasionally some students do not succeed? Are some of the concepts becoming dated? Have you seen, or read, or heard about someone else who has had success with some other package? In short, are you becoming less comfortable with the package than you were at first? If so, the time has come to consider revision. If new discoveries

resulting from space exploration have modified some of the concepts you had when you designed the instructional package, then you will obviously want to correct any misconceptions your package may foster. For example, the traditional picture of the planets portrays Saturn as a brilliant gleaming ball surrounded by sparkling rings, the only planet so decoratively enhanced. Now the latest astronomical study has revealed that Uranus is similarly ringed, only with even more rings than Saturn. Should you ignore this new fact? If you choose to incorporate such a fact into your existing package, it means a revision of several of the items that make up the package. For example, you may have produced a bulletin board display of the nine planets and, of course, only Saturn was portrayed with rings. Now you really need to add rings to your representation of Uranus. Furthermore, they should be darker in color and of different thickness and width. (At least that is how present astronomical theory presents the picture.) But you may also have, in your possession a filmstrip which you purchased with scarce funds. It is not possible for you to create a different picture of Uranus and incorporate it into the filmstrip, so you have only two options, abandon the use of the filmstrip, or use it and try to correct the mistaken concept. In either case you are revising what was originally a successful, comfortable package. It no longer fits correctly. You sense a need for a new, correct filmstrip, but the budget won't allow it. A good picture of the planet with its rings is available from a current newspaper, so a quick trip to the Media Center results in a photographic slide which can replace or supplement the incorrect view presented in the filmstrip. A new concern is, however, hereby introduced. You must have a slide projector available even though the main presentation is by filmstrip. This seems like a great inconvenience; so ultimately, the decision is made to abandon the filmstrip in favor of a complete slide set made from various photographs of the planets and other bodies in the solar system. Using the facilities available in the media center, a complete revision of this one segment of the instructional package has restored the comfortable fit and all will work well again.

Similarly, if the number of pupils in the class has significantly increased, some small group elements of the package may need revision. If the racial, ethnic or I.Q. make-up of the class has completely changed, there may no longer be a need for the package. This may call for a further step in the revisionary process, the step to be elaborated in the next chapter.

## CHAPTER 12
## STARTING OVER AGAIN

> "You have been looking at your current instructional package and have concluded that it is no longer adequate for you. You think you would like to build a new curriculum of your own, but you again don't want a typical commercial package. So you return to your trusted instructional developer who once again determines who you are and who you have now become."

You had an excellent teaching package which worked well for you and, most importantly, worked well for the pupils who passed through your classroom. However, time has passed. New facts have been discovered which make major elements of your package out of date. The socio-economic make-up of the children in your class has changed and they now have (or lack) the kind of home encouragement which was the case earlier. The size of the class has been greatly changed. Many other factors have changed and with all of this change you have come to feel that the package, even after various revisions, is no longer adequate. Your only choice now is to abandon it entirely and design a new unit more suitable to the needs and realities of the present.

While this all sounds quite final, as if it would be a last ditch effort to be made before retirement, it is, in fact, part of the regular on-going process of total instructional development. One unit of your work may be at this state, and be ready for disposal and complete new structuring while another unit may only need a minor remodeling (see Chapter 11) and several other units may be working just perfectly. The process is perpetual, never ending and continuous. Every system is always in a state of change, always becoming something, either better or worse. Change is natural, and usually desirable, if the reason for the change is to enhance the probability that the learners will learn more, better, and/or faster. But beware of making changes just for the sake of change.

What should you do when you feel that time for a total change has come? The instructional development process suggests that you turn back to the beginning of this treatise and start over since you have come full circle. You must again determine what it is that needs to be communicated, analyze the audience and write the objectives to be achieved. You will be well served to return to the instructional developer you successfully worked with before. You can share your new ideas with someone else who may also have some new insights to help you. You will, of course, work through the dreaming stage, the recognition of realities, the gathering of materials and the assembling of a workable package. Finally, you will use this package over a period of time, always alert to remodeling needs and ultimately the disposal and replacement of the package.

## CHAPTER 13
## CONCLUSION

We must point out that while the instructional development process sounds logical and may look, on paper, as though one should always start at a particular place in the cycle, in fact, teachers start at many places in the cycle and still succeed. Maybe you have a viable package, working well which depends on a certain 16mm film for one major component. Suppose that film is destroyed accidentally, and is not replaceable. Maybe a complete revision of the unit is the only alternative, or maybe a slow remodeling can be done to accommodate some other material in place of the lost 16mm film, or you may decide on some other changes. Whatever your decision, wherever you start, whatever you are stimulated to try, the fact remains that the functions enumerated in the various chapters of this treatise must all be accomplished in some order before you will have generated a personal feeling of success in the use of the instructional development process. Once you do have this feeling of success, you will probably become an instructional developer yourself. Not only will you improve the learning environment for the pupils in your classroom but you will be able to help other teachers begin the instructional development process for themselves.

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